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VOL. LXV.

JANUARY—JUNE, 1900.

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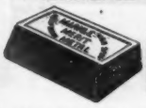

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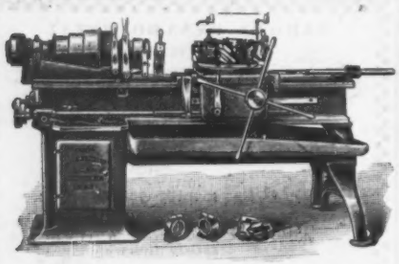

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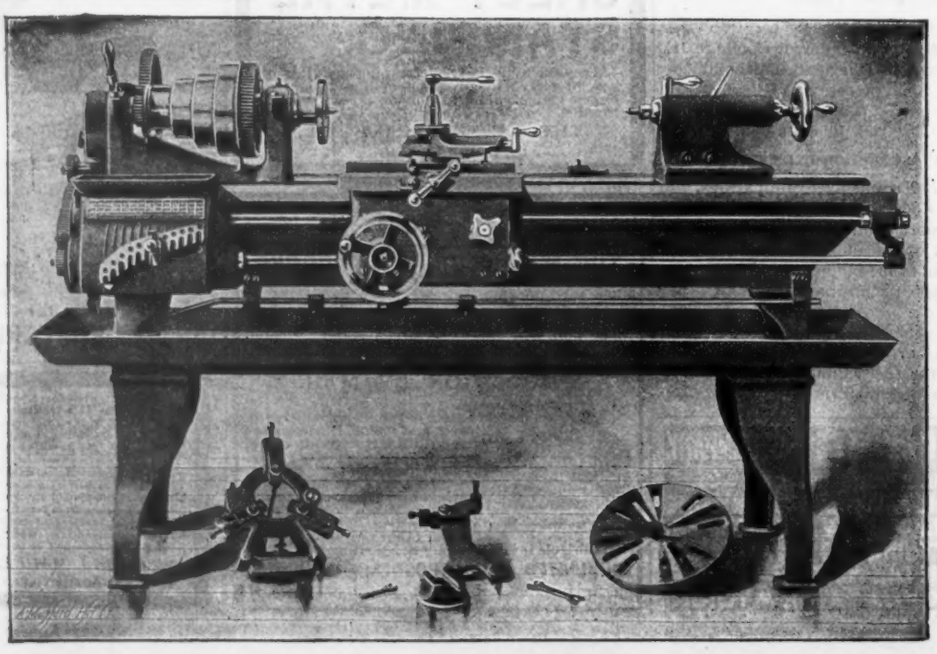


THE IRON AGE.

THURSDAY, JANUARY 4, 1900.

THE MOST PERFECT MACHINE SHOP.—I.

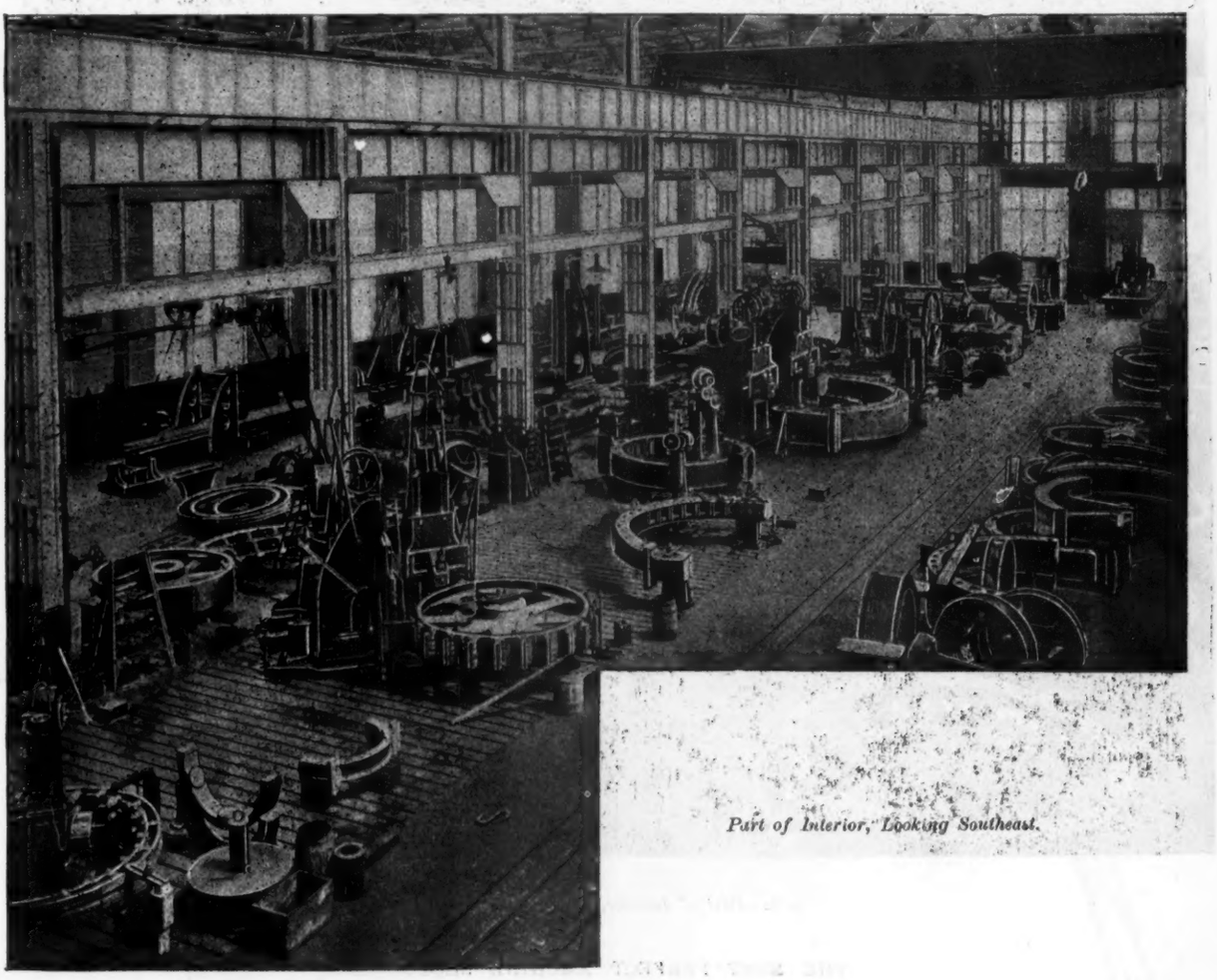
Building No. 16 of the Schenectady Works of the General Electric Co.

By S. D. V. BURR.

The title, "The Most Perfect Machine Shop," is placed at the head of this article advisedly. Knowing full well that it is a significant statement, we are convinced that it is strictly correct. In making this assertion we are not influenced by the size of the plant in question. While its dimensions are certainly great and so unusual as to be noteworthy, they are merely the result of the demands made by the work to be carried on, and may be ignored as factors influencing perfection. A man may make a toy engine in a closet, but he cannot make a 1500 kw. generator in a place of restricted dimensions. Therefore the size. A massive machine requires a large building and appliances proportionate to its own size, in order that it may be produced with due economy. Cramped quarters are not conducive to convenience of operation, and are expensive in any industry.

A perfect manufacturing establishment must have three characteristics: 1, A building, large or small, so designed as to best facilitate the work to be done in it. This may be taken as meaning the comfort and convenience of the men and the proper grouping of machines; but the nature of the operations carried on may make it impossible to thoroughly look after or regard the physical comfort of the workman. Neither a refrigerating works nor a crucible steel plant is a pleasant place to labor in. Again, it would be foolishness perfected to design a brilliantly lighted building for the making of photographic dry plates. Nevertheless, the machine shop building, *per se*, can always be so erected as to provide for ample lighting, adequate heating, proper ventilation and the necessary sanitary conditions. A modern shop lacking any of these features cannot turn out its product with the same facility and with the same degree of economy as is possible in the one of best design. These considerations are all recognized by the manufacturer of to-day, who knows that it is a financial investment of the very best kind to provide for his men the best that can be obtained.

2. The equipment, like the building, is governed by the character of the product. Here there can be but



Part of Interior, Looking Southeast.

one ruling motive: to procure the best obtainable for the work in hand. An antiquated tool is a vexation of spirit to every one having anything to do with it. A perfect machine both in design and construction is the pride of the average American mechanic, and his sympathy with it causes him, unconsciously perhaps, to accomplish more and to produce better results. For this reason alone, if for no other, it is an investment which pays handsomely.

Appliances for easily handling all the work are the natural accompaniments of the most improved tools. Many a manager will plan and worry month after month in order to save a dollar at his coal pile, and will finally spend thousands of dollars in order to accomplish this. At the same time he may utterly fail to see where he can save the wages of a helper by spending a few hundred dollars in providing a labor saving device. He does not recognize how great is the difference in the interest account of the two items. It is, of course, true that the power transmission system is of the utmost importance. No matter what method may be employed it should be more than adequate for the most severe requirements, should permit of expansion, should be well arranged, and should be under the easy and perfect control of the operator of a tool. More than one job has been ruined by a miserably designed main shaft and a belt shifter placed out of reach. To provide individual power which can be increased and diminished at will, according to the demand, is an ideal plan, when considered solely from the operator's standpoint.

3. A management capable of so handling the live and dead elements as to yield the highest results is the most essential factor in the whole problem. A shop absolutely perfect in every respect may be ruined by bungling control. The ability to handle men and materials so as to obtain the most in the least time and with the smallest expenditure is a qualification possessed by very few. It is more difficult to govern a man so as to bring into execution all his faculties than it is to get the best out of a machine. This may seem ridiculous, but the majority of men cannot do either. A man is full of vagaries which must be humored and controlled, rebuked and coddled. The machine has none. It merely requires operating and skillful care for the development of all there is in it. Many men have a multitude of notions, and they influence one or the other. Many machines have none, and they know no combinations. But the man must feed the machine; they must work together as one. The human factor furnishes the soul for animating the other. This implies the selection of the two best adapted to labor in harmony. Many individuals can plan, many can execute, but only a few can do both. This problem falls to the lot of the management for solution, the task being one of the greatest difficulty. This group of officers is responsible for the running of the works and for the economical production of whatever is to be made. The management decides when to increase the works, when to buy materials, when to consign a tool to the scrap pile and buy a new one, and other questions without number. In a large plant it is fortunately imperative that the responsibility be divided and the departments placed in actual control of separate heads. The perfect result comes when all the divisions are united in the single aim to produce the best at the lowest cost.

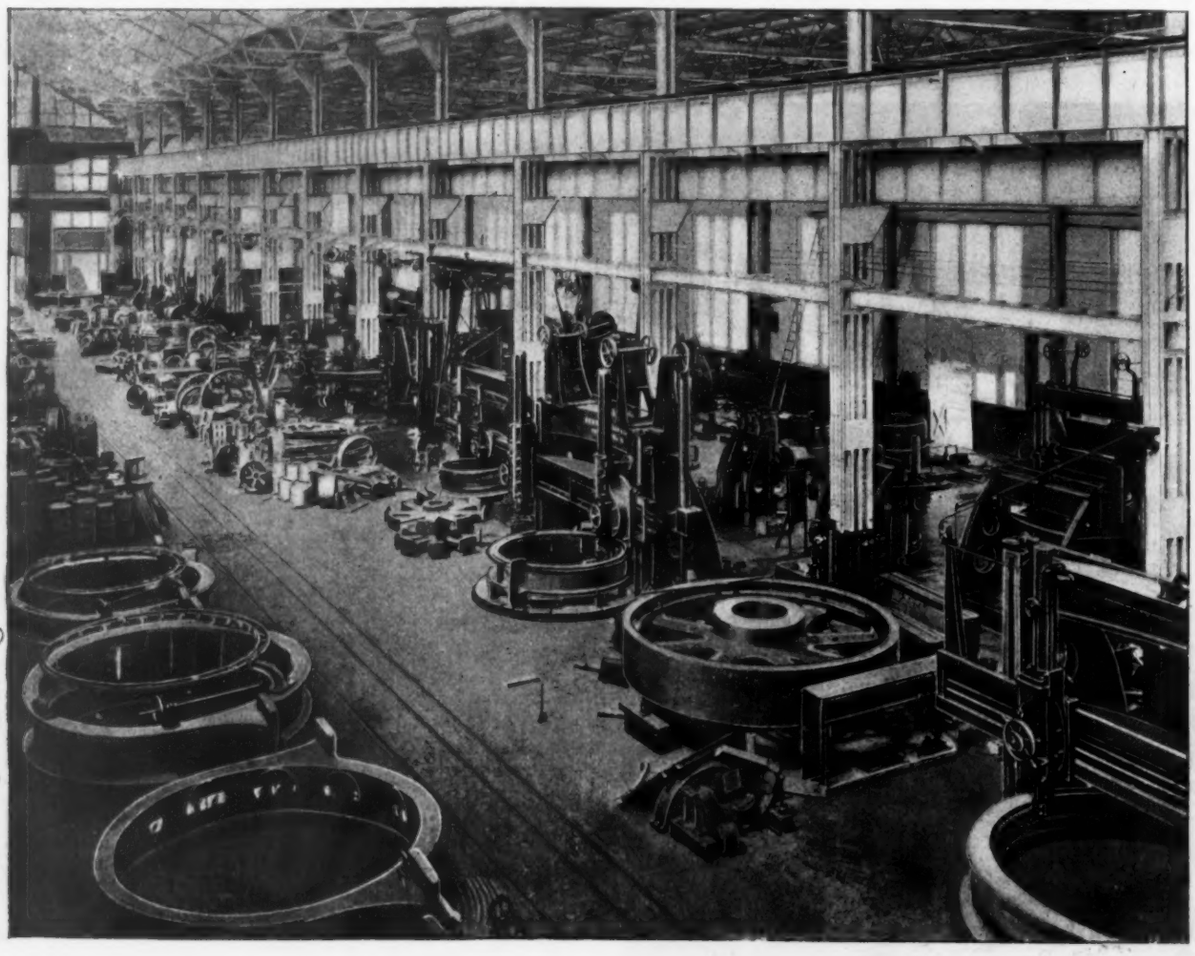


Fig. 2.—Part of Interior, Looking Northeast.

THE MOST PERFECT MACHINE SHOP.

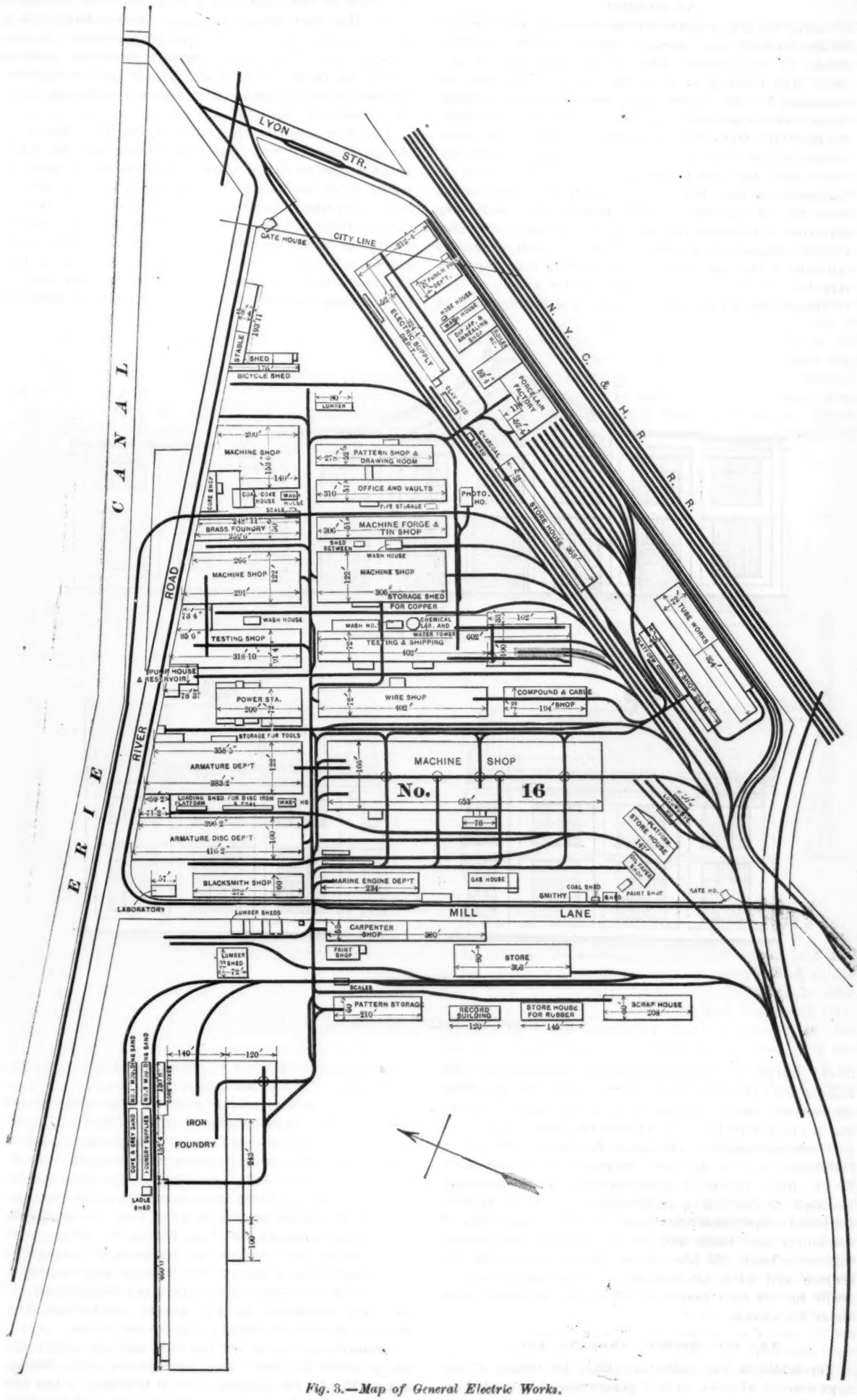


Fig. 3.—Map of General Electric Works.

THE MOST PERFECT MACHINE SHOP.

An Example.

All of the above qualifications appear to be embodied in the machine shop recently finished at the extensive works of the General Electric Company at Schenectady. The building is up to date in its design and the materials of its construction, and embraces valuable characteristics peculiarly its own. As for the equipment, we need only state that the standard tools are the latest designs of the best makers, while the special tools embrace many new and admirable features. The entire arrangement is such that work is made easy, and at the same time is expedited in every possible way, and every appliance is provided for the rapid, systematic and convenient disposal of product. If we are correct in our estimate of the case there can be nothing inappropriate, therefore, in the title at the head of this article.

This is due to two causes. There is a management in direct charge knowing intimately all the needs and possessing the experience and skill necessary for providing the remedy, and a board of direction willingly co-operating in every way toward attaining the goal sought.

Those immediately responsible for the scheme and its fulfillment were C. A. Coffin, president of the company; E. W. Rice, Jr., third vice-president; G. E. Emmons, manager of the works at Schenectady; A. L. Rohrer, electrical superintendent; John Riddell, supervisor of machinery and tools, and W. A. Pearson, supervising engineer. Each did his utmost toward advancing the project, and while all worked in unison each deserves credit for his own particular efforts in the department under his charge.

The New Machine Shop (No. 16).

The addition was made necessary by reason of the large amount of work on new generators of unusual size. Heretofore these had been more or less scattered through the other buildings, which were not especially adapted for work of this kind, and it was, therefore, carried on under the most disadvantageous surroundings and at an increased cost, which was unnecessary. It was thought that if all these scattered branches could be united the result would more than justify the expense; further, orders in hand and in prospect made imperative an increase in capacity.

The works are located between the Erie Canal and the tracks of the New York Central Railroad, the layout being shown in Fig. 3. Traversing the entire yard, entering all of the buildings and passing entirely through some, is a railroad system actuated by electricity. Within the buildings and in some parts of the yard the surface contact or button method of taking up the current is employed, while in the others there is the overhead trolley. The motor cars are equipped for either method, and can consequently be used everywhere. Most of the buildings are also entered by 4 foot 8½ inch guage tracks switching from those of the steam railroad.

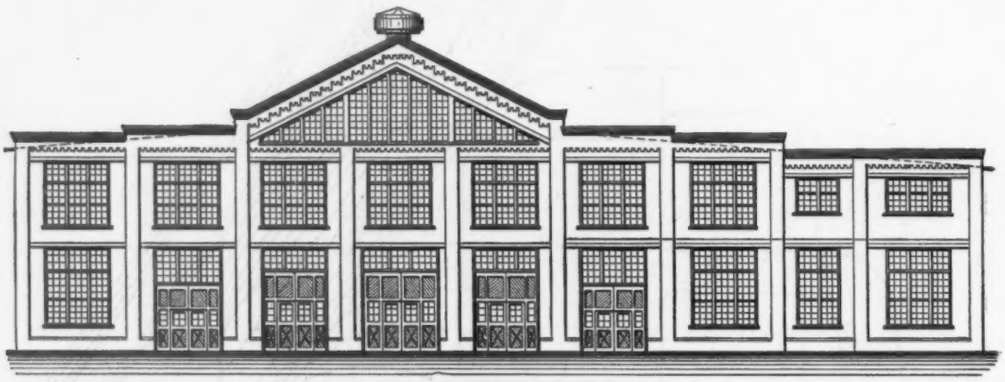


Fig. 4.—Front Elevations.

Fig. 5.—Side Elevation.

THE MOST PERFECT MACHINE SHOP.

Electrical transmission of power is employed throughout, the power station being centrally located. Electric motors are used for every conceivable purpose, in some cases where they seem inappropriate until we note the saving in manual labor resulting from their employment. All the machines throughout the entire plant are electrically driven, in groups when they are small, and by individual motors for those calling for large power. This was not done because the company are engaged in the manufacture of motors, but because they considered the method preferable to all others in every respect. All the large machines, as will appear further on, were changed in order to adapt them to the motor.

Ground was broken for the new machine shop building on June 27, 1898. The foundations were finished August 15, and the columns erected October 3. The iron work was entirely finished by October 31, and the brick work on the following November 15. In the meantime

the roof had been laid, and by January 23, 1899, or seven months from the turning of the first sod, the entire building had been inclosed. During the whole period photographs had been taken every week, which, collectively, present the most complete idea of the progress of the work and the rapidity with which it was carried on.

The placing and arrangement of the tools was practically decided upon before the building was erected, and as a result it was possible to lay all the foundations for the machine tools at the same time the building foundations were put in. The building was designed from the production standpoint—that is, the department was laid out and the tools all located, after which the space was inclosed by the walls and roof.

Some idea of the rapidity with which the work of installation was carried on may be formed from the following brief statement:

On March 10 the first 40-ton crane was completed and put into operation.

On March 23 the second 40-ton crane was completed and put into operation.

On March 31 the first machine tool was operated.

On March 25 the 25-foot Niles mill was first turned around, and on April 4 it was put regularly on production work.

On April 19 the first length of line shafting was turned around.

The tools previously ordered began to arrive as soon as one end of the building had been partially roofed, and continued uninterruptedly until the entire equipment had been placed in position. An inspection of the shop one year from the date of its inception conveyed no idea of the fact that it occupied ground so recently vacant.

The above remarks convey no conception of the vast amount of labor of a preliminary character which had been performed. This was the planning of the building itself, the altering of standard tools, and the designing of all those of special types. Yet when the photographs accompanying this article were taken, about three months ago, the building appeared to be crowded with tools and work finished and unfinished, and it seemed to be about time to plan an addition.

The elevations, Figs. 2 and 3, show the design of the exterior, while some of the details of construction are indicated in Figs. 4 to 7. The building is 653 feet in length by 166 feet in width, and extends in a direction nearly due north and south. As indicated by the drawings, Figs. 4 and 5, it is a composite iron and brick structure formed of a main central portion 64 feet in width and two wings each 46 feet 7¼ inches in width. The clear hight from the floor to the bottom chord of the roof trusses is 46 feet in the center and 40 feet in the wings. The column foundations are of concrete, the pedestals being bolted down, as shown in Figs. 6 and 7. The two middle rows where the wings join the main building are formed of double columns which carry the tracks of the traveling cranes. The details of its construction are indicated in Fig. 5.

The floor consists of a 6-inch bed of tar and cinders, upon which are laid hemlock boards 3 inches thick upon which is nailed a top course of matched maple 1⅛ inches thick. In the experience of the company this method of constructing flooring has been found to give the greatest satisfaction and to be a most reliable preventive of rot.

The roof of the wing portions of the building is covered with asphalt. The center roof is of tin, and is pierced by two skylights, each 22 feet in width by 550 feet in length. These, in connection with the ample side and end lights, afford a splendidly illumined interior, there being absolutely no dark spot in the whole shop. The skylight is composed of what is known as "translucent fabric," a substitute for glass. This consists of a wire cloth imbedded in a translucent impervious material, the whole being strong and durable, and at the same time flexible and elastic. The joints made with the fabric are entirely water proof, and there is no leaking arising from expansion and contraction of the frames. The fabric is of a pale amber color, and the light it transmits is of somewhat the same tone. It is, however, very soft and pleasant to work under, being entirely free from glare.

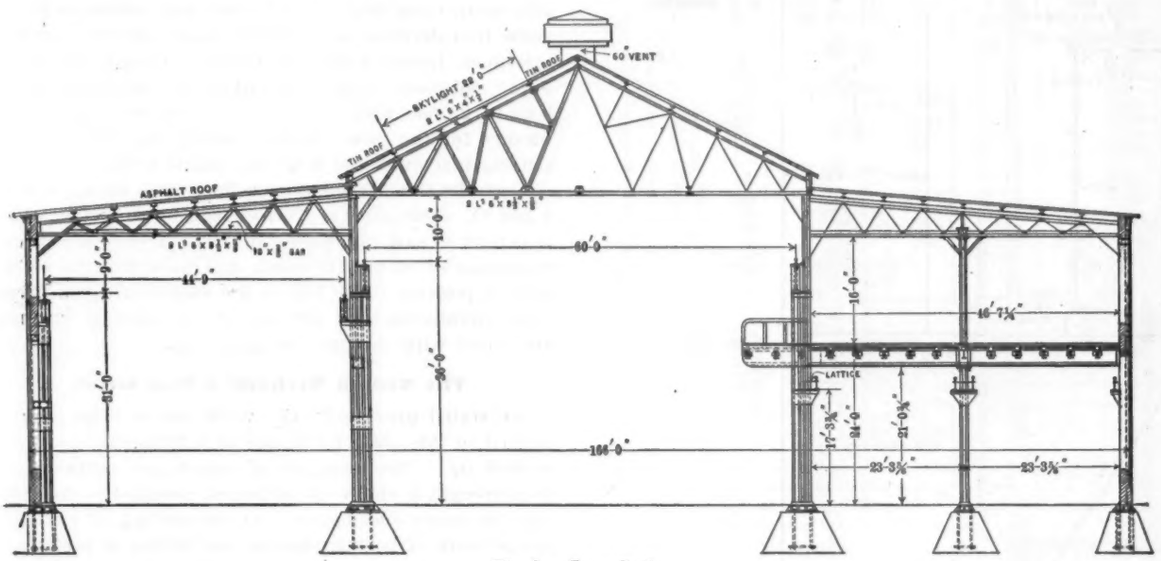


Fig. 6.—Cross Section.

THE MOST PERFECT MACHINE SHOP.

Departments in the Building.

The arrangement of the principal departments on the main floor and the disposition of the tools are shown in Figs. 10 and 11. Our engravings represent the entire main floor, and are intended to be placed end to end so as to form a single drawing. Extending entirely through the shop lengthwise are two tracks, the narrow gauge belonging to the yard itself, and the standard gauge leading to the tracks of the New York Central Railroad and D. & H. C. Co. Railway. Transverse narrow gauge tracks provided with turn tables where they cross the main track extend to the buildings on each side. These provide for the quick and easy moving of supplies from one part of the works to another, and for the shipment of the finished articles.

As will be noticed in the cross section, Fig. 4, there is a gallery extending the entire length of the western wing. In the southwest corner of this gallery is the

mica department, in which the mica is sorted, split, glued and pressed into the many forms required. There is but little waste in the handling of this valuable material.

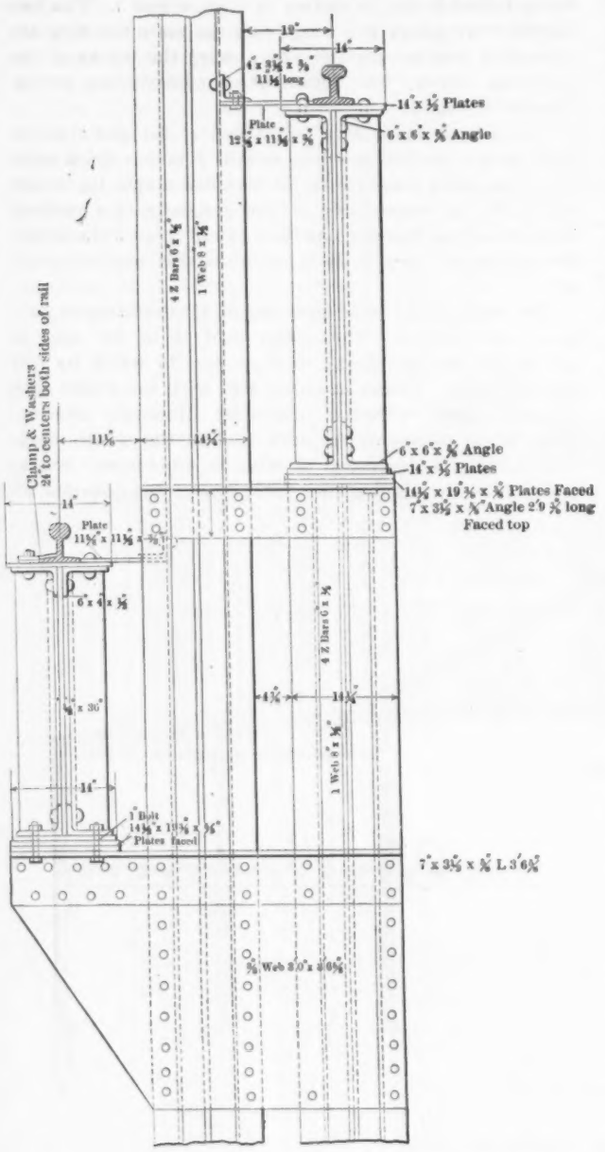


Fig. 7.—Detail of Column, Showing Traveling Crane Tracks.

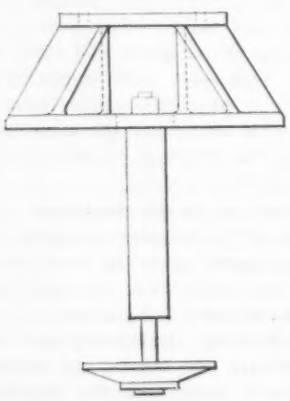


Fig. 8.

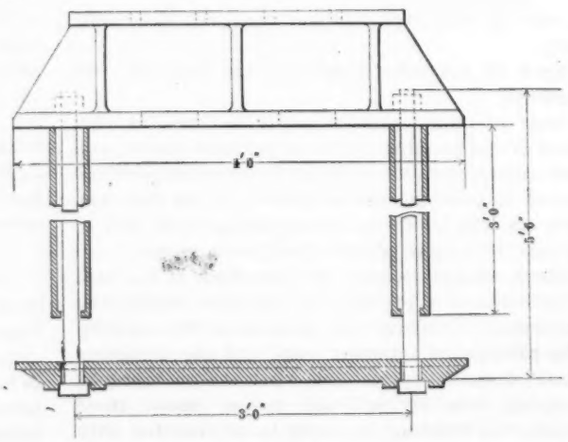


Fig. 9.

Sectional Elevation of Column Foundations.

they are intended for. Work upon commutators is carried on in the northwestern portion of the gallery.

A good idea of the interior of the building may be had from the two photographs, Figs. 1 and 2, which are taken from the center of the western gallery, and which look southeast and northeast respectively. The tools shown in the center aisles of Fig. 1 are all portable, and are intended primarily to work upon the immense floor plate. The machines shown in the other view are stationary, the immediate foreground being occupied by large boring and turning mills.

Referring now to the plan view showing the tool arrangement, it will be seen that the northeastern corner is occupied by armature filling machines, and is used for assembling large and small armatures, pole pieces, pressing in shafts, &c. Next come groups of horizontal boring machines, drill presses and milling machines. Further on toward the center and against the wall are placed small boring and turning mills, the large boring mills shown in Fig. 2 being placed partly in the main aisle and partly in the side aisle.

In the northwest corner are the winding and coiling machines, the commutator assembling department and the tools necessary for this particular work. Adjoining this is an oven built in the west wall, after which we come to a division occupied by small planers, chucking machines, boring mills and lathes. Abreast the lathes is the tool room, while in an addition, measuring 78 feet long by 22 feet wide, are the water closets, lavatory and lockers for the men. Further along this wing are the slotting machines and large and small lathes.

Opposite this is the immense floor plate shown in Figs. 1 and 11. This plate is 125 feet long by 20 feet in width. It is built of cast iron plates, in which T slots are spaced, by means of which the work and tools may be rigidly held in position. The beams are supported upon a concrete foundation and the top of the plate is surfaced and lined with the greatest accuracy.

The Modern Mechanic a Tool Setter.

As stated previously, the work, say a large ring, is carried to this plate by means of a traveling crane and leveled up. The tools, all of which are portable, are then brought to the work, adjusted, clamped to the plate, and the operations begun. At one setting of the piece all the work of boring, planing and milling is performed. the only work not done upon this plate being performed by the large boring and turning mills just mentioned. The tools here used vary in type and design, but are

THE MOST PERFECT MACHINE SHOP.

The small pieces are glued together to form slabs of varying sizes and shapes, which are formed in hot molds, after which they pass to the several machines principally intended for planing, shaping, boring and milling.

It will now be conceived that the workman here en-

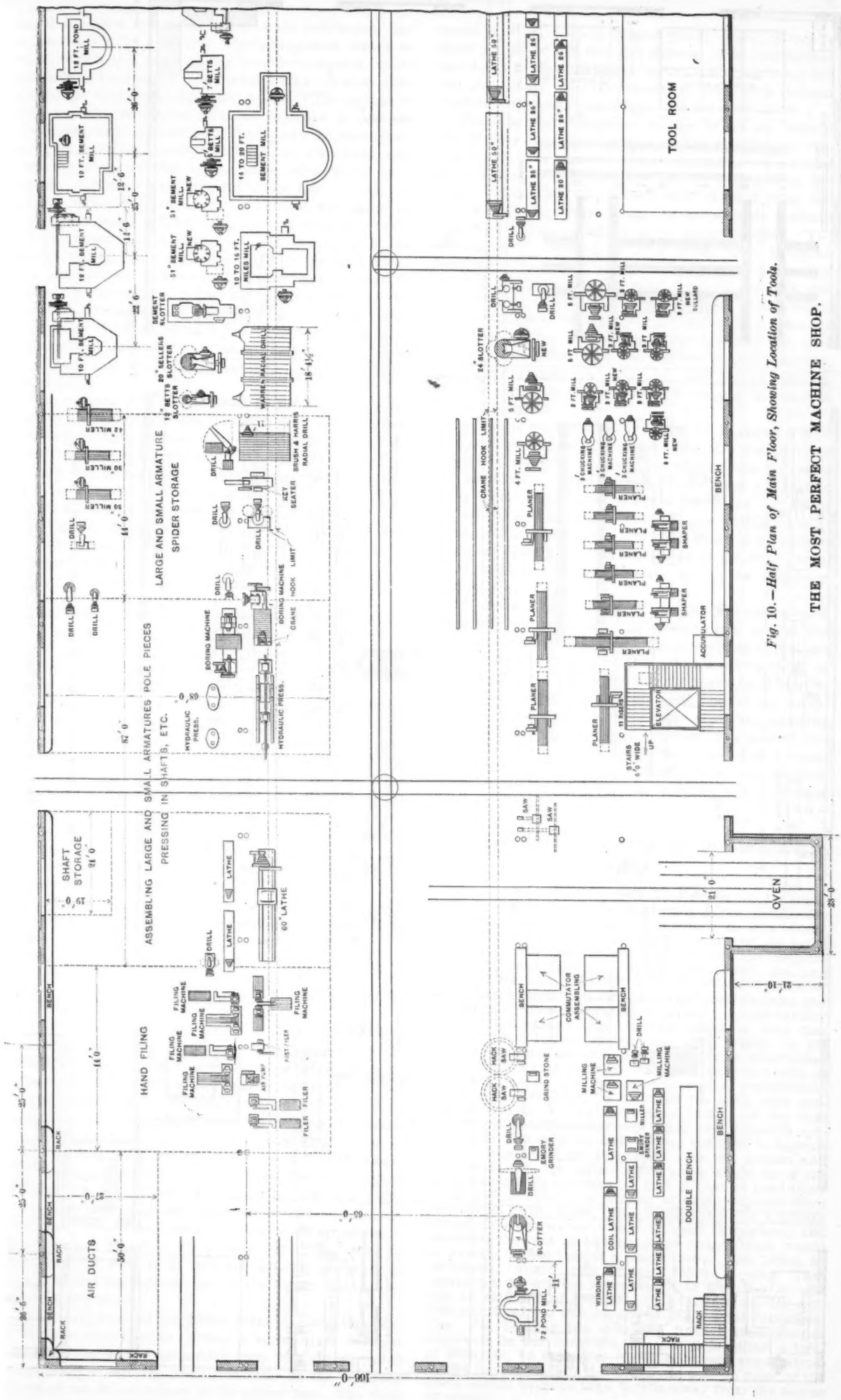


Fig. 10.—Half Plan of Main Floor, Showing Location of Tools.

THE MOST PERFECT MACHINE SHOP.

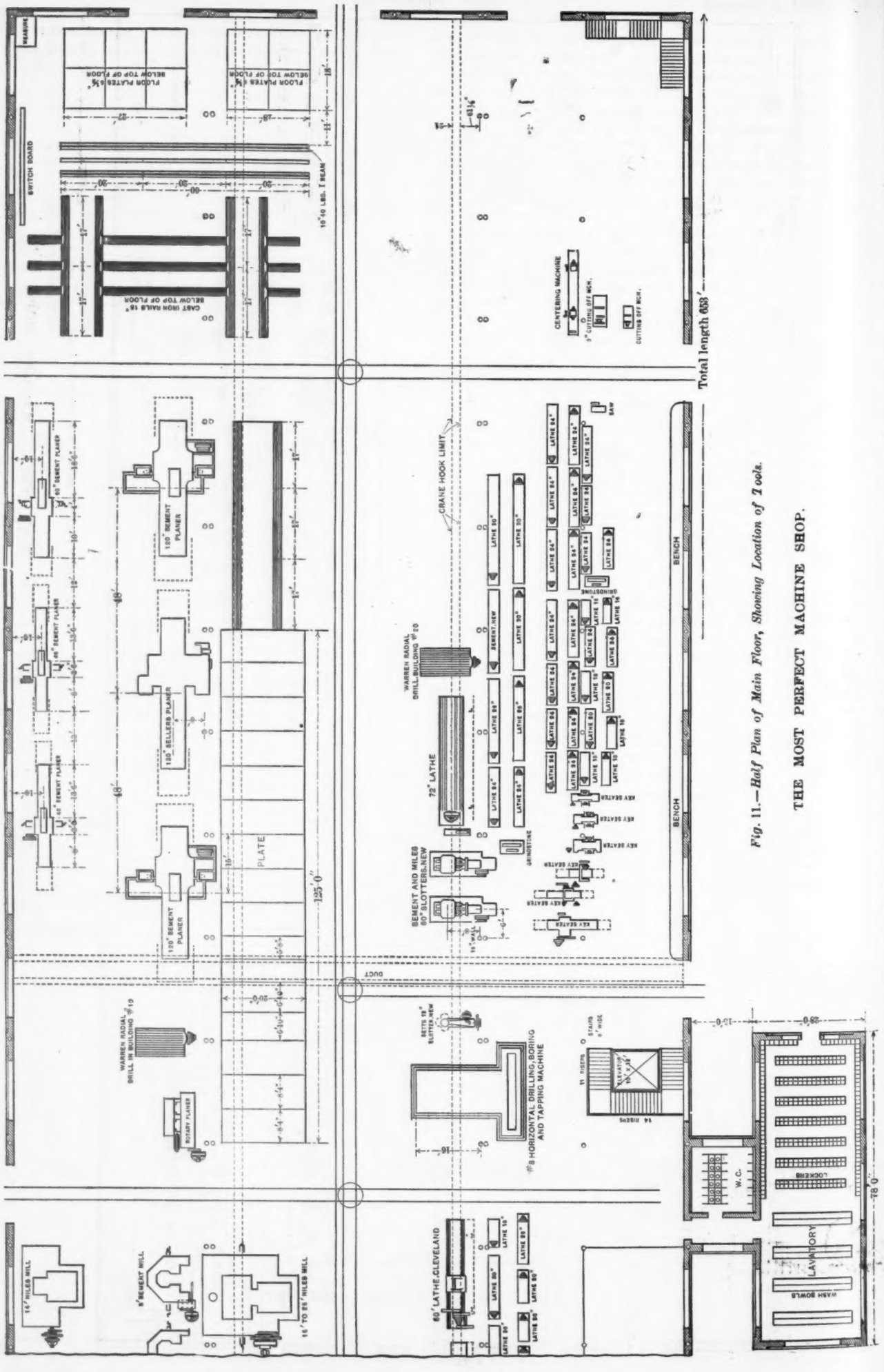


Fig. 11.—Half Plan of Main Floor, Showing Location of Tools.

THE MOST PERFECT MACHINE SHOP.

gaged is a most refined specimen of the tool setter. He is provided with a perfect foundation upon which to work, which is a plane of the greatest accuracy, while the tools at his disposal are designed with the same nice regard for alignment. In other words, if the tool, as is the case with several of them, be intended to perform the operation of a slotter, its stroke may be considered as being absolutely perpendicular to its own base, and therefore perpendicular to the plate upon which it is bolted. Knowing this the workman has no care as regards either the horizontal or vertical operations of the several tools. All he is required to do is to provide for the proper cutting of the tool, and to place it in the correct position with regard to the piece operated upon. The two largest machines, slotters weighing some 17 tons each, have been removed from one part of the plate to another, adjusted, and set in operation inside of an hour. The consequence of all this is that the work is expedited in a wonderful manner, accuracy of product is assured, and the cost of production most materially reduced.

All shifting of portable tools is done by the three traveling cranes under the direction of a special gang. They are brought as near as possible to the position required by the sub-foreman, which usually varies but an inch or so from their desired location, after which they are brought to true working position by hand. Even in the short time the shop has been in operation the men have become remarkably expert in this line and but little time is wasted, and errors of judgment are remarkably few.

Crane Equipment.

The center portion of the building is traversed by three Morgan cranes, two of 40-ton capacity and one of 15-ton, and having a span of 65 feet and a hight from the floor to the top of the rails of 36 feet. Both 40-ton cranes are fitted with 5-ton auxiliary hoists in addition to the main hoist. To operate the main hoist there is an 80 horse-power General Electric motor giving a hoisting speed with full load of 22 feet per minute. The hook is carried on eight strands of chain, one-fourth of the total load being suspended from the drum and the other three-fourths from a strong cross bar resting upon the trolley frames.

The auxiliary hoists are operated by 25 horse-power motors, the hoisting speed with full load being 50 feet per minute. The hook in this case is carried on two strands of chain. The drum is grooved right and left, and there is no reducton between the hook and drum. By this arrangement the chain takes an inverted pyramidal form, giving an absolutely vertical lift and obviating all vibration. The cross travel is operated by a 5 horse-power motor, giving a speed of 100 feet per minute. The motor for this motion is also mounted on the trolley.

The longitudinal travel motor is of 25 horse-power, imparting a speed of from 225 to 300 feet per minute. This motor is located at the center of the crane bridge, so as to equally distribute the torsion on the main driving shaft. Both ends of the shaft are fitted with pinions working into gears which are attached to the track wheels, and thus drive both ends at the same speed.

In the east wing are two cranes, one 40 and one 10 ton, having a span of 44 feet 9 inches. The larger crane is fitted with a 25 horse-power motor for the main hoist, giving a lifting speed of 12 feet per minute. The auxiliary hoist, cross travel and longitudinal travel are each fitted with a motor of 15 horse-power. The speed of the auxiliary hoist is 52 feet per minute, of the cross travel 95 feet per minute, and of the longitudinal travel 185 feet per minute.

The main hoist of the 10-ton crane is furnished with a 25 horse-power motor, giving a speed of 27 feet per minute. The load is suspended from two chains which wind directly onto the drum, the same as the auxiliary hoists of the 40-ton cranes in the center bay. The cross travel is fitted with a 5 horse-power motor, giving a speed of 125 to 150 feet per minute. The longitudinal travel has a 25 horse-power motor, the speed being 300 feet per minute. All the cranes are fitted with General Electric Company's controllers, one for each motor.

The following description applies to all the cranes: The girders are of box section, as are also the end carriages and trolley sides. The track wheels are made of steel, bushed with bronze, and revolve loosely upon the axles. The axles are carried clear through from one side of the trolley to the other, and are securely fastened at each end to assist in holding the trolley together. The gearing is all arranged to drive direct, there being no bevel gears nor worm gears whatever. Two brakes are supplied to prevent the running down of the load, one an automatic electric brake and the other an automatic mechancal brake. Should there be any accident whereby the current is cut off the brakes act instantly and hold the load suspended until the current is again applied, when, by reversing the motor, the load can be lowered. By this means any accidental lowering of the load is surely prevented.

Current is conveyed to the cranes by means of a bare wire strung along the side of the building, a trolley wheel picking up the wire as the crane moves along the track, the same as in street car service. Wires are strung along inner side of the girders to carry the current to the motors on the trolley. Double pole switches are so arranged that when they are open there is no current whatever passing through the wiring of the crane, making it perfectly safe to handle any part of the machinery without fear of shock.

Jib cranes are provided for serving the tools placed along the columns separating the northern half of the main bay and western wing. Small portable cranes are also furnished mounted upon trucks for the handling of lighter loads, but which are still too heavy for a man to lift without assistance. On the main floor in the southern half of the western wing there are 5-ton traveling cranes for the convenience of the men there located, the hoisting and long travel being driven by 7 and 3 horse-power motors, respectively; these motors are operated by controllers handled from the floor by means of ropes and sheave wheels.

Reconstructing the Tramways in Manchester, England.

Manchester is seeking to borrow $4,000,000 for tramway purposes, the scheme comprising the reconstruction of the whole of the present track within the city boundary, the electrical equipment of the whole of the track in the city and the outside districts that the corporation had already come to an agreement with, the provision of 600 cars, and the estimate of construction of one carshed to accommodate 252 cars, and also the preliminary expenses chargeable to capital. At the inquiry C. H. Wordingham, city electrical engineer, said that the overhead trolley system was that which, in his opinion, was best suited to the exigencies of Manchester traffic, with a single trolley wire and using the rails as a return. As to the various systems of construction which were available, he regarded the span wire construction, with the center running trolley, as the best mechanically, while what was called the Aigburth system, with side running trolley, was the best in appearance. They might use in some streets one system and in other streets the second. The poles would be of the same strength in all cases, so that in case of need there would be no trouble in passing at slight expense from one system to the other. He assumed that the Aigburth system of construction would be used throughout, and therefore the cost of equipment of double track would be exactly double that of a single track. This latter, he estimated, would approximate $6500 a mile. That meant for an overhead equipment of 68 miles in the city an estimate of $442,000, with $120,500 for the outside districts. To this he added $82,875 for contingencies. For bonding the rails and further contingencies therewith he put down $84,625, this giving them a total of $750,009. In regard to the stations and sub-stations, it was the proposal of the committee that no point of the track should be more than ½ mile away from the source of supply.

The Philadelphia Iron Trade in 1899.

BY THOMAS HOBSON, PHILADELPHIA, PA.

The most eventful year that the iron trade ever experienced is now drawing to a close. It has not been so uniformly satisfactory in results as might be supposed from the great and rapid advances which have been made in prices. When Pig Iron reached $14 to $16 per ton buyers took immense quantities; the same thing was done on comparatively small advances in plates, sheets, bars, &c. Large purchases had been made before prices began to show any tendency toward an advance, and when 25 to 50 per cent. more was tacked on sellers gladly accepted almost all the business that was offered to them, hoping thereby to secure a fair average. This had been good policy in former years, but in this instance experience was not a safe teacher. Everything doubled in price before manufacturers realized where they were at, and as cost in the way of higher wages, &c., began to make serious inroads, it became clear to those who had to buy material in the open market that they had given away pretty nearly all their profits, and in some cases more than that. Then came the usual scramble for deliveries, which intensified the situation without advantage to either side. Requirements were undoubtedly much greater than had been anticipated, but wherever one carload of iron was needed two or three were asked for, so as to be sure of being on the safe side. Buyers bid against each other until a good many of the low priced contracts were ignored temporarily, or postponed to a more convenient season. In this way a somewhat better average was secured, and taking everything into account there has been no cause for serious complaint, as the same policy was adopted along the entire line, and big and little had to take the same kind of medicine. Possibly it may, after all, have been the best thing that could happen, as there is now an opportunity for straightening things out, and until some agreement can be made in regard to next year's prices deliveries on old contracts can be completed, which, in fact, is now very generally being done. The question of prices for 1900 is the most difficult problem at the present time, but in a general way it does not appear likely that there will be very much change. Much, of course, will depend upon the course of events in South Africa and in the money markets. Apart from these uncertainties we might confidently look for a bigger year's business in 1900 than we have had during 1899. Pending a readjustment of these questions a conservative position may be expected, although there is much that could be said of an optimistic character. Trade is good the world over; Great Britain will consume more and produce less, and as the Continental ironmasters are up to their neck in business there is no country but the United States that can be looked to for relief. Our exports for the ten months of this year ending with October amount to 800,000 tons of iron and steel, without counting in machinery, agricultural implements, hardware, &c. It would not take much of a reduction in prices to double that tonnage during the coming year. A still more dependable business, however, may be expected from the railroads in our own country. A complete re-equipment to meet new conditions will be an imperative necessity in the near future. Some of the strongest roads have made a good beginning already, and others must follow as quickly as possible. The rail tonnage during the coming year is therefore likely to be the heaviest on record, while the orders already entered for the heaviest kind of cars, locomotives, bridges, terminals, &c., are extraordinarily large. It must be remembered that the material for all these equipments is as yet practically underground, and has therefore to furnish a lot of work before it reaches the ultimate consumer. Business of this character implies corresponding activity in machinery and engineering branches, which are enormous consumers of iron and steel. Shipbuilding is also expected to attain larger proportions than ever before, so that taking a broad view of the situation the country has abundant cause for satisfaction and thankfulness for the measure of prosperity already realized, as well as hopeful expectancy for the year which will soon dawn upon us.

Pig Iron.

The year 1899 has been a record breaker in every sense of the word. We closed 1897 with a production of 226,000 tons of pig iron per week, and December of 1898 with 243,000 tons per week, and we shall doubtless close 1899 with a production of 300,000 tons per week. Equally significant is the fact that stocks on hand at the close of 1897 were 736,000 tons, and on the corresponding month of last year 506,000 tons, and this year may be safely estimated at less than 150,000 tons. From these figures it may be safely assumed that consumption during 1899 has averaged considerably over 1,000,000 tons per month. Prices during the year more than doubled themselves. The first sales in January were on the basis of $11.50 for No. 2 X Foundry, at the end of the first quarter of the year they had reached $16, at the end of the second quarter $19, the third quarter $23, since which time sales have been made at $24.50 to $25, gradually settling back to about $23.75, which may be regarded as a fair average at this time. Basic iron and low phosphorus have moved in about the same relative proportions, the lowest figures for the former having been $10.75 in January, with a steady advance to $23.25 in November. Low phosphorus sold at $16 in January, up to $29 in November, and these figures for the two specialties named are about as well as can be done to-day. The advance in prices has been singularly uniform, and notwithstanding the comparatively high prices now ruling there is not the slightest sign of weakening, and what is more remarkable there has been no reaction during the entire year. Every advance has been maintained, and although periods of dullness intervened prices remained firm until they made a new advance. One year ago we wrote as follows:

"With a current output which is now equal to about 12,250,000 tons per year, and which will probably be increased to 12,500,000 tons in course of the next three months, people say it is astonishing how prices hold up. Upon careful consideration, however, it will be seen that there is nothing abnormal in it. The iron is wanted, it is passing into consumption as rapidly as it is made, and there is every reason to believe that the market in 1899 will be broader and bigger than it was in 1898; therefore, why shouldn't prices advance? The wonder is that they have not advanced more."

At this time, however, the situation is too complicated to venture upon very positive predictions, although the indications are favorable for a larger business during the first half of the coming year than during the first half of the one now closing. One reason for this opinion is that the capacity for consumption is greater than it was a year ago. Until very recently the supply of pig metal has been insufficient to meet current requirements. This is shown by the steady decrease in stocks, but from this time forward it is expected that the increased capacity for production will become available, so that consumption will not be retarded as it has been by the scarcity of raw material. This does not imply that there is likely to be much of a surplus; on the contrary, it looks as though whatever increase there may be in production will be pretty well offset by increased consumption, but if a few thousand tons per week can be piled up during the winter months it will do no harm. The margin of supply has been too close for comfort, and an increase in stocks of a few hundred thousand tons ought not to cause uneasiness, although such increase probably would have that effect. Nevertheless, if we are to have any increase at all it will probably be shown in the January and February furnace reports. Prospects for consumption are excellent. Probably the greatest impetus to business during the coming year will come (as already mentioned) from the railway interests. It is difficult to give close estimates on the rail tonnage, but there is little doubt

that it will exceed any former year, the highest to date having been 2,139,000 tons, in 1887. The small and miscellaneous consumers will no doubt require as much or more iron than during the present year, and there is also a fair probability that the export demand will again assume important proportions. Prices for some months past have not only been a little too high for foreign markets, but we have had no iron to spare, and a considerable tonnage which was sold for export was repurchased for the home trade. European requirements promise to be very large, however, and as ores, fuel, labor and other items of cost are growing scarcer and dearer, it is not unlikely that they will be heavy purchasers of American iron during the coming year. The war in South Africa will make a serious inroad on British trade, as they will be compelled to use more, and at the same time to produce less; but, as we said before, the question of the greatest importance at this time is in regard to prices. It was easy enough to see the trend of the market last year, but it is not so to-day. The immediate prospect, however, does not favor the idea of lower prices, but the reverse, and would be still more so if the financial situation was better. It cannot be said to be bad as regards the manufacturing and mercantile interests, it is distinctly good, in fact, but with such an uneasy feeling in the leading money centers there must necessarily be some hesitation until the clouds roll by. The cost of production will be high, and unless some unforeseen calamity occurs there is not going to be much surplus of iron during the coming year. The recent falling off in demand is of less significance than the continued firmness in prices. The time has not arrived yet when makers of pig iron are seeking a market, or when they are lowering their prices in anticipation of such an event. This is conclusive evidence of strength as regards the present situation, and so far as can be seen there is nothing in the near future likely to be of a less favorable character. Sudden and unforeseen developments which are beyond all human foresight may occur and thereby change the entire situation, but apart from these iron is not likely to go much, if anything, below present prices, and under favorable conditions, such as an early termination of the war in South Africa and a settled money market, the chances are rather in favor of a higher range of prices during the next six months than during the six months now closing.

As regards the Eastern group of furnaces, the prospects are more favorable than for some years past. The reputation which they have had for a high quality of iron has been specially in evidence during the past year, and the output of most of the furnaces could have been sold many times over if the iron could have been spared. Improvements have been made by nearly all the companies, and the Warwick Iron & Steel Company have contracted for an additional furnace, which it is needless to say will be of the most modern and up to date type. The ore supply will also be on a more ample scale than of late years, the sources of supply will include Cuba and Newfoundland, besides a large increase from the Jersey and other local mines. Important results are confidently looked for in this direction, and, to say the least, Eastern Pennsylvania expects to hold its own in the forward movements of the coming year.

The range of prices for tidewater deliveries during each month of the year was as follows:

JANUARY.

No. 1 X foundry	$12.00 to $12.50
No. 2 X foundry	11.50 to 11.75
No. 2 plain	11.00 to 11.25
Standard mill iron	10.75 to 11.00
Basic iron	10.75 to 11.00
Low phosphorus	16.00 to 16.50

FEBRUARY.

No. 1 X foundry	$13.00 to $13.50
No. 2 X foundry	12.25 to 12.50
Standard mill iron	11.50 to 11.75
Basic, nominal at	11.00 to 11.25
Low phosphorus	16.50 to 17.00

MARCH.

No. 1 X foundry	$16.50 to $17.00
No. 2 X foundry	15.75 to 16.25
Plain	15.25 to 15.50
Basic	15.00 to 15.25
Low phosphorus	18.50 to 19.50
Standard mill iron	15.25 to 15.50

APRIL.

No. 1 X foundry	$16.50 to $17.00
No. 2 X foundry	15.75 to 16.25
Plain	15.25 to 15.50
Standard mill iron	15.00 to 15.25
Basic	15.00 to 15.25
Low phosphorus	19.50 to 20.00

MAY.

No. 1 X foundry	$16.75 to $17.25
No. 2 X foundry	16.00 to 16.50
Plain	15.50 to 15.75
Basic	15.75 to 16.00
Low phosphorus	19.50 to 20.00

JUNE.

No. 1 X foundry	$20.00 to .....
No. 2 X foundry	18.50 to $19.50
No. 2 plain	17.50 to 18.00
Standard mill iron	17.00 to 17.50
Basic	18.50 to 19.00
Bessemer	20.00 to 21.00

JULY.

No. 1 X foundry	$20.50 to $21.00
No. 2 X foundry	20.00 to 20.75
No. 2 plain	19.25 to 19.50
Standard mill iron	18.00 to 18.25
Basic (nominal)	20.50 to 21.00
Bessemer	20.00 to 21.00
Low phosphorus	25.00 to 26.00

AUGUST.

No. 1 X foundry	$22.50 to $23.00
No. 2 X foundry	21.25 to 22.00
No. 2 plain	20.00 to 20.25
Standard mill iron	18.50 to 19.00
Basic	22.50 to 23.00
Bessemer	21.50 to 22.50
Low phosphorus	26.00 to 27.00

SEPTEMBER.

No. 1 X foundry	$23.50 to $24.00
No. 2 X foundry	22.50 to 23.00
No. 2 plain	21.00 to 21.50
Standard mill iron	19.50 to 20.00
Basic	23.00 to 23.25
Bessemer	25.00 to 26.00
Low phosphorus	27.50 to 28.00

OCTOBER.

No. 1 X foundry	$23.50 to $24.00
No. 2 X foundry	22.75 to 23.00
No. 2 plain	21.50 to 21.75
Standard mill iron	19.75 to 20.00
Basic	23.25 to 23.50
Bessemer (nominal)	25.00 to 26.00
Low phosphorus	27.50 to 28.00

NOVEMBER.

No. 1 X foundry	$25.00 to $25.50
No. 2 X foundry	23.25 to 24.25
No. 2 plain	22.25 to 22.75
Standard mill iron	20.25 to 21.00
Basic	23.00 to 23.50
Bessemer (nominal)	25.00 to 26.00
Low phosphorus, f.o.b. cars furnace	27.00 to 28.00

DECEMBER.

No. 1 X foundry	$25.00 to $25.50
No. 2 X foundry	23.25 to 24.25
No. 2 plain	22.25 to 22.75
Standard mill iron	20.25 to 21.00
Basic	22.75 to 23.00
Bessemer (nominal)	25.00 to 26.00
Low phosphorus, f.o.b. cars furnace	27.00 to 28.00

Billets.

Prices have ruled extraordinarily high, and for several months it was almost impossible to get steel. Prices began in January at about $19, but a month later they were advanced to $23, the next month to $27, in April to $28, May to $30, June to $34, July to $36, August to $40, and from that date, to and including part of November, anywhere from $40 to $42. During the present month strenuous attempts have been made to get prices down to a lower level, some think $32 to $35 would be high enough, but so far makers have not come anywhere near to those figures, and show no disposition to do so. They might, perhaps, do $36 to $37 on firm offers from the right kind of buyers, but so far as known, neither side has named definite prices on anything like large lots. Advices from reliable parties in London, however, are to the effect that American steel has been offered at $35 delivered at British ports, and it is also believed that lots of 25,000 to 50,000 tons have been offered at about that figure delivered to American mills, but as yet the situation is still unsettled. The stand off is prolonged somewhat by the fact that overdue steel is being delivered, which relieves consumers temporarily. At this writing, therefore, it is impossible to say what will be done in regard to next year's prices, but it is surprising how firm makers are, considering the continued abstention of buyers.

Finished Material.

There is no year on record that will compare with 1899 as regards the volume of business and the extraordinary advance in prices. There is not a mill in the country that has not been able to run full time, and to full capacity, except at very short intervals. Some articles more than doubled their prices, the highest point having been reached in October, when ordinary plates sold as high as 3.1 cents, and in some cases for immediate delivery as high as 3.25 cents was paid. Bars sold as high as 2.3 cents, angles and beams 2.75 to 3 cents. These were emergency prices, however, and were not representative of the entire market. The output at all the mills has been extraordinary, yet for months past there was a chronic condition of scarcity.

The coming year is expected to show a vast increase in the output of plates by the Eastern mills. Harrisburg, Coatesville, Chester and Danville, Pa., and Wilmington, Del., will add enormously to the productive capacity, and as some of these plants, such as the Lukens at Coates-

ville and the Diamond Steel at Wilmington, will have the most modern and the most perfect appliances, they may be counted upon to hold their own against all comers. It would be a bold assertion to say that manufacturers will have it as easy during the coming year as they have had it during 1899, as the capacity for plate production will be so greatly increased, and while there may be business enough to go around, it will be the longest pole that will bring down the persimmons.

Prices will probably depend upon the cost of raw material more than they have this year, but there is plenty of margin to come and go on. The bar and skelp mills have had an extraordinarily good year, and have excellent prospects for the coming year. Prices look high compared with what they have been for several years past, but, comparatively speaking, they are lower than any article on the list, and on any further decline would be likely to develop a large export demand. Present prices in Great Britain are £10 10s., equal to $51.20, while prices here at 2.10 cents f.o.b. would be $47.20, leaving a margin of about $4 per ton for shipping and other charges. There is, therefore, an element of security in the bar trade which is not so much in evidence in some other lines. The structural mills have also had an excellent year, and prospects for 1900 are regarded as very satisfactory. Bridge builders and structural mills, such as the Phœnix and Pencoyd, have made world wide records, and as these plants are kept fully abreast with the times, their position is practically unassailable. The works at Pottstown are gradually getting into position, and the Pottstown Iron & Steel Company are also expected to begin operations in course of a few weeks from now. Plenty of work is in prospect, however, and there is little doubt that there will be enough to go around, unless some extraordinary conditions intervene. Fluctuations in prices during the year were as follows, although considerably more was sometimes paid to secure immediate shipment:

	Plates, ¼-inch	Refined bars	Angles
JANUARY.	1.40c.	1.15c.	1.40c.
FEBRUARY.	1.65c.	1.20c.	1.45c.
MARCH.	2.15c.	1.50c.	1.55c.
APRIL.	2.25c.	1.50c.	1.55c.
MAY.	2.30c.	1.50c.	1.65c.
JUNE.	2.60c.	2.00c.	1.80c.
JULY.	2.75c.	2.10c.	2.25c.
AUGUST.	2.75c.	2.10c.	2.40c.
SEPTEMBER.	3.10c.	2.15c.	2.40c.
OCTOBER.	3.10c.	2.20c.	2.40c.
NOVEMBER.	2.75c.	2.20c.	2.40c.
DECEMBER.	2.55c.	2.20c.	2.40c.

Old Material.

In no department of the iron trade have there been greater changes than in Old Material. Prices at the beginning of the year were abnormally low, but steadily advanced until about a month ago, when it was evident that the limit had been reached so far as 1899 was concerned. The difficulty in securing pig iron and steel billets and other primary materials caused an immense demand for the various grades of old material, some of which commanded extremely high prices at times.

During the past two or three weeks, however, there has been a gradual shrinkage in the demand, although less than might have been expected, considering the fact that the largest consumers retired from the market coincident with refusals from the railways to accept further shipments to some of the leading consuming centers until several hundred cars were released, which were on the sidings at such points as Harrisburg, Columbia, Lebanon, &c. The following will show the range of prices month by month for deliveries in buyers' yards:

JANUARY.

Cast borings	$7.50 to $7.75
Wrought turnings	8.50 to 8.75
Machinery cast	9.50 to 9.75
Car wheels	10.50 to 10.75
Heavy steel scrap	11.25 to 11.50
Iron rails	13.25 to 13.75
Choice railway scrap	13.25 to 13.50
Iron axles	15.00 to 15.50
Steel axles	12.00 to 12.50

FEBRUARY.

Cast borings	$8.00 to $8.25
Wrought turnings	9.00 to 9.25
Machinery cast	10.00 to 10.25
Old car wheels	12.50 to 13.00
Heavy steel scrap	11.75 to 12.25
Iron rails	13.75 to 14.00
Choice railway scrap	13.25 to 13.50
Iron axles	15.50 to 16.00
Steel axles	13.00 to 14.00

MARCH.

Cast borings	$9.75 to $10.25
Wrought turnings	10.75 to 11.25
Machinery cast	13.50 to 14.00
Old car wheels	15.00 to 15.50
Heavy steel scrap	14.50 to 15.50
Iron rails	17.50 to 18.00
Choice railway scrap	17.00 to 17.50
Iron axles	21.00 to 22.00
Steel axles	16.50 to 17.50

APRIL.

Cast borings	$10.25 to $10.50
Wrought turnings	11.25 to 11.75
Machinery cast	13.00 to 13.50
Old car wheels	15.00 to 15.50
Heavy steel scrap	14.50 to 15.50
Iron rails	18.00 to 19.00
Choice railway scrap	17.50 to 18.50
Iron axles	21.00 to 22.00
Steel axles	16.50 to 17.50

MAY.

Cast borings	$10.50 to $11.00
Wrought turnings	11.50 to 12.00
Machinery cast	13.00 to 13.50
Car wheels	15.00 to 15.50
Heavy steel scrap	13.75 to 14.00
Iron rails	18.00 to 19.00
No. 1 railway scrap	19.00 to 20.00
Iron axles	21.00 to 22.00
Steel axles	17.00 to 17.50

JUNE.

Cast borings	$11.00 to $11.25
Wrought turnings	11.50 to 12.00
Machinery cast	13.50 to 14.25
Old car wheels	16.00 to 16.50
Heavy steel scrap	15.00 to 15.50
Iron rails	19.50 to 20.00
No. 1 railway scrap	19.00 to 20.00
Iron axles	23.00 to 25.00
Steel axles	17.00 to 17.50

JULY.

Cast borings	$11.00 to $11.25
Wrought turnings	12.50 to 12.75
Machinery cast	13.75 to 14.25
Old car wheels	16.50 to 17.00
Heavy steel scrap	15.00 to 16.00
Iron rails	20.00 to 21.00
No. 1 railway scrap	19.50 to 20.50
Iron axles	23.00 to 25.00
Steel axles	17.00 to 17.50

AUGUST.

Cast borings	$11.00 to $11.25
Wrought turnings	12.50 to 12.75
Machinery cast	14.50 to 15.00
Old car wheels	17.75 to 18.00
Heavy steel scrap	17.50 to 18.50
Iron rails	21.50 to 22.50
No. 1 railway scrap	20.00 to 21.00
Iron axles	25.00 to 26.00
Steel axles	18.00 to 19.00

SEPTEMBER.

Cast borings	$11.50 to $12.00
Wrought turnings	12.75 to 13.00
Machinery cast	16.00 to 17.50
Old car wheels	20.50 to 21.00
Heavy steel scrap	19.00 to 19.50
Iron rails	25.00 to 26.00
No. 1 railway scrap	22.50 to 24.00
Iron axles	27.00 to 28.00
Steel axles	26.00 to 28.00

OCTOBER.

Cast borings	$13.75 to $14.00
Wrought turnings	14.75 to 15.00
Machinery cast	17.50 to 18.00
Old car wheels	22.00 to 24.00
Heavy steel scrap	20.00 to 21.50
Iron rails	30.00 to 32.00
No. 1 railway scrap	26.00 to 28.00
Iron axles	30.00 to 32.00
Steel axles	30.00 to 32.00

NOVEMBER.

Cast borings	$14.50 to $15.00
Wrought turnings	16.00 to 16.25
Machinery cast	18.00 to 19.00
Old car wheels	23.00 to 24.00
Heavy steel scrap	22.50 to 24.00
Iron rails	29.00 to 30.00
No. 1 railway scrap	26.00 to 28.00
Iron axles	31.00 to 32.00
Steel axles	30.00 to 32.00

DECEMBER.

Cast borings	$14.00 to $14.50
Wrought turnings	15.25 to 15.75
Machinery cast	17.00 to 18.00
Old car wheels	21.00 to 22.00
Heavy steel scrap	20.00 to 20.50
Iron rails	27.00 to 29.00
No. 1 railway scrap	24.00 to 26.00
Iron axles	28.00 to 30.00
Steel axles	27.00 to 29.00

Advance in Use of Electricity.

At the recent meeting of the British Institution of Electrical Engineers, Prof. Silvanus P. Thompson, the new president, delivered his inaugural address, in the course of which he pointed to the increased use in telegraphy of automatic methods of sending. The use of the automatic transmitter is extending in cable service, and on the continent and in America the advantages of the Wheatstone automatic are being recognized. The use of alternating currents of a fairly high frequency is also receiving attention, and the substitution of delicate optical receivers, worked by photography, for the relays and recorders previously employed has opened out a further field. With regard to sub-marine cables, there is still the old difficulty that no improvements in apparatus at the ends of the cable would get rid of the sluggishness inherent in the cable itself, if constructed on the traditional patterns, and the suggestion he himself made in 1893, that a cable should be constructed with a series of self inductive artificial leaks of high resistance distributed along its length to combat its distributive capacity, appears too radical to be acceptable to the authorities. It is singular that the properties of the rare earths which form the foundation of the invention of the Welsbach mantle have not been turned to account in electric illumination before the invention of the Nernst lamp—for the commercial introduction of which electrical engineers are still waiting expectantly—but in the meantime a far more important factor in the economic struggle remains in the reduction of the high prime cost of electric wiring. Could electric house wiring be caried out as simply and cheaply as the putting in of gas pipes an enormous advance might be confidently expected; but so long as station engineers and fire insurance inspectors insist on having both wires insulated and refuse to allow an uninsulated or semi-insulated return, so long will this advance be delayed. In the public distribution of electric energy a revolution is being effected. Ten years ago a distribution at 6 miles from the generating station was looked upon askance by many engineers; to-day it is recognized that the secret of economical work is to generate on the large scale and distribute over large areas at an appropriately high voltage. The great superiority of alternating currents for motive power and all long distance work is becoming more apparent every day, though the continuous curent, of course, remains the only species admissible for electrolytic work with all its rapidly growing applications in the chemical industries. Only a short time ago alternating currents were decried on the alleged ground that alternating current motors were not self starting. But the simple truth is that continuous currents will not work motors at all, and the sole function of the costly commutator that is an integral part of every so called continuous current motor is to commute a continuous current into an alternating one. Moreover, it introduces the risks attendant on the use of brushes—risks that have led the insurance companies to prescribe that all motors with commutators should be put in fire proof inclosures.

The Bristol Round Recording Pressure Gauge.

The illustrations, Figs. 1 and 2, show exterior and interior views of a new round recording presssure gauge that is being placed on the market by the Bristol Company of Waterbury, Conn. This new form has been designed to meet a demand for a recording gauge at a lower price than their standard gauges. A special feature of the round form is that the dial is located slightly eccentrically to the main body of the case, thus allowing sufficient space on lower side of the dial for the pen arm to pass out between the dial and case.

Fig. 1 shows the front of the gauge complete and ready for application. Fig. 2 shows the interior construction of the instrument and the extreme simplicity upon which its accuracy and durability depend to a large degree. The pen arm is directly attached to the free end of a tube of flattened cross section which is bent into a helical form.

The tendency of the pressure applied is to straighten or uncoil the helical tube which causes the pen arm to move over the range of the chart without the necessity of any intervening multiplying devices.

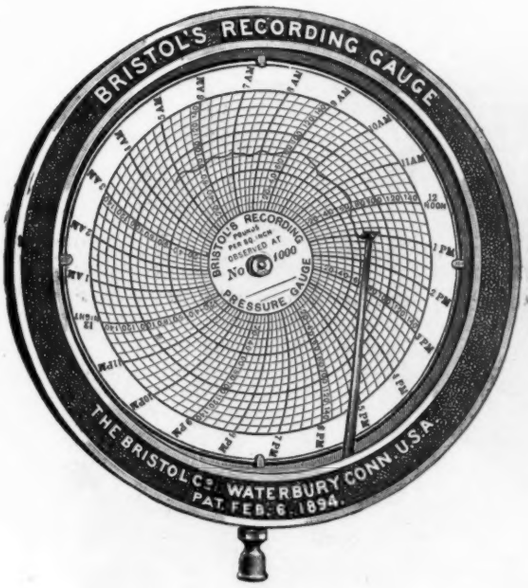


Fig. 1.

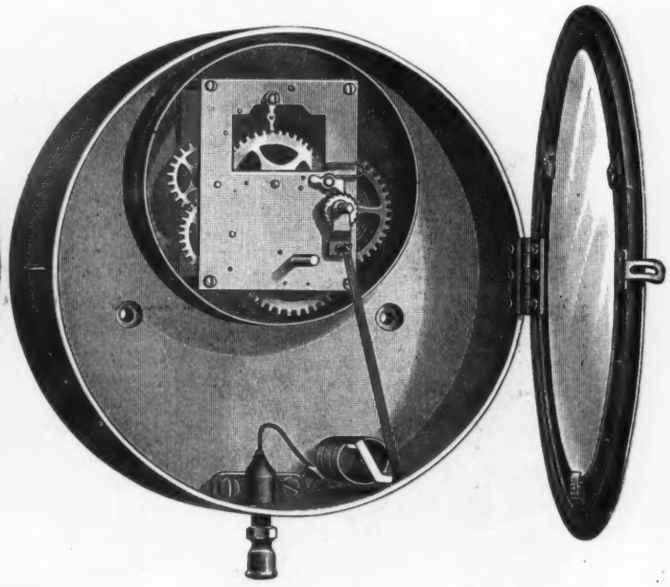


Fig. 2.

THE BRISTOL ROUND RECORDING GAUGE.

New Swedish Ironclads.

The Swedish Government has accepted the offers from the Kockum Engineering Company, the Berzsund Engineering Company, and that of the New Motala Engineering Company and the Lindholmen Engineering Company jointly to build each a first-class ironclad, the prices being respectively $640,000, about $750,000, and about $750,000. The Government has also placed at the disposal of the naval authorities the necessary funds (about $1,500,000) for the completion of the first-class ironclad "Drietigheten," for the building of four torpedo boats, and for the providing of new war ship material. The Swedish naval authorities have declined the tenders received for armor and armament, and the Government has recommended the authorities to further negotiate about armament, so as to secure cheap offers. With regard to the armament, the Government has, some time ago, ordered from the Borfors Gullspang Company 21 and 15 cm. guns for two of the above-mentioned ironclads, and the Stockholm Weapon Factory and the Finspong Company have since received orders for 20 57 mm. rapid firing guns for the above ironclads, and 27 similar guns for older war ships. Contracts have not yet been signed as regards the third of the new ironclads,

but these are also likely to be placed within the country. Altogether Swedish firms have secured nearly the whole of these important contracts.

The Dalton Ditch Digging Machine

An ingenious machine, which has just been perfected, for the purpose of digging ditches or trenches is herewith illustrated. Its utility has been practically demonstrated by John A. McGarry & Co., 189 Racine avenue, Chicago, who have recently been filling contracts for improvements on the Evanston Park addition to North Evanston, Ill. McGarry & Co. had several miles of sewer and water ditch to dig under their contracts. Wishing to avoid the expense and annoyance of the ordinary methods of hand labor, they arranged with a local inventor, Richard Dalton of Wilmette, who had been experimenting for years with a ditch digging machine, and had up to that time met with but slight encouragement in his efforts in that direction, to use his invention on this work. The machine proved a revelation. One trial convinced the contractors that it would revolutionize the business of digging ditches for ordinary sewer and water work.

The action of the machine is quite novel, and, although crudely built, it has done its work to the entire satisfaction of the engineers of the city of Evanston, surprising them by the efficiency of its operation. A description of the machine is as follows:

The actual excavating is performed by a series of plows attached to the radial arms of a large wheel about 12 feet in diameter, which is driven at its circumference by a sprocket chain from a smaller sprocket wheel on the engine shaft of a portable engine forming part of the machine. The plows extend a little further out than the mouths of the buckets, of which latter there are four on each side of the wheel. When the wheel is rotated, the plows loosen the earth, and as the earth falls away from the plows it slides into the buckets. These buckets are fastened at the end of a hinged radial arm, whose other end is attached near the axle of the wheel. When these arms, which are locked during the operation of filling, reach a little above the level of the top of the ditch, the lock disengages, and they swing out on either side of the machine, and in the revolution of the wheel dump their loads on either bank, and further on in the revolution they fall back by gravity to the wheel, are automatically locked, and on their downward course pick up another load, and so on. The machine is mounted on wheels, and as it digs is moved forward by a chain 200 to 300 feet long, attached at one end to a temporarily fixed post and wound by means of a ratchet wheel and chain pulleys driven by the same engine that operates the plows.

By means of liners placed between the tire of the wheel and the various radial arms, the width of the ditch excavated can be anywhere from 30 to 72 inches. By a rocker arm arrangement pivoted on the road wheels of the machine the ditch can be made of any depth up to 8½ feet with the machine now in use. Its capacity on this particular work has been up to 470 lineal feet of ditch per day of 9 hours, 6 feet deep and 3 feet wide, in a very tough kind of stony hard pan, with only four or five men required in its operation. This is almost 1 foot a minute. The fact is obvious that it displaces a great deal of hand labor, and therefore will decidedly cheapen the cost of excavating ditches.

THE DALTON DITCH DIGGING MACHINE.

The Consolidations and the Money Market.

Charles S. Fairchild, ex-Secretary of the Treasury, concluded a paper read before the American Economic Association at Ithaca, N. Y., with the following paragraph: As to the effect upon the money market of all these new securities, it is hard to say. It must be remembered that the great bulk of them are in the hands of the owners of the original constituent properties. It must also be remembered that the cash capital provided upon the formation of the new corporation has taken from the money market a large amount of industrial commercial paper; in its place is the borrowing upon the securities of the new corporations. As to what proportion the one bears to the other, there are no data to be had. At a venture, however, I would say that there is little, if any, more money loaned now upon the shares of new industrial combinations than there would be now loaned upon the business paper of the constituent concerns had the combinations not been formed. Of course I say this bearing in mind the demand for money accommodation that would have been caused by the present business and manufacturing activity. Probably the places where the loans are made have been changed. More comes upon New York and the business centers, and less upon the banks in the places where the separate factories are. This may partially account for the greater money pressure in New York with comparative ease in the interior. All of this will, however, soon adjust itself by the aid of the rapid communication given by railroads and telegraphs, and the business world will move on with certainly no more rapid changes up and down in the future than in the past. In the meantime prudence and judgment must be used that the unworthy may not have undue opportunities, and also that the worthy may not be unduly repressed. A great help and safeguard

would be some well devised plan of publicity as to corporate earnings and expenses.

The Coshocton Rolling Mill Company.—The plant of the Coshocton Rolling Mill Company of Coshocton, Ohio, is rapidly nearing completion. Two sheet mills will be placed in operation on or about February 1, and another will be added in early spring. While the plant is small, it will be equipped with every convenience for reducing labor cost and producing a fine quality of work. The machinery is all new, and is designed to meet the requirements for heavy tonnage, no expense being spared to lead to ultimate decreased cost of operating. The company will place on the market common and cold rolled sheets annealed to any required temperature for special purposes. They propose also to make a specialty of their registered and patented brand, Beard's Royal Blue Sheet Steel. This material is to be clean rolled and carefully annealed, the aim being to make every sheet of uniform blue color, the quality to be such that it can then be used in place of much more expensive material. The officers of the company are A. Beard, president; W. C. Bryant, secretary; D. A. Raiff, treasurer. The operating department will be under the charge of William E. Ward, superintendent, formerly of Atlanta, Ind. Mr. Beard's family has been prominent in the iron trade in England for generations, and nearly all the rollers who will be engaged with the new company are direct descendants of the men who worked alongside Mr. Beard's ancestors. They have been selected on account of their knowledge and skill in this particuar line of industry. The company expect to be ready to make deliveries on or about December 15. We are requested to say that the report that this company are offering black plates for tinning is not true.

According to press accounts the Ann Arbor Railroad has closed a contract with the Marconi people for apparatus to operate a system of wireless telegraphy in connection with the car ferry business of that road across Lake Michigan. One office is to be at Frankfort, Mich., on the east side of the lake, and the other at Menominee, Mich., on the west side, the distance between the two points being 83 miles. A direct line between the two points passes across the peninsula to the east of Green Bay. At present the railroad company must depend for telegraphic communication upon a line around the lake, through Chicago, and, quite frequently, during stormy weather, the company are put to a good deal of inconvenience by the interruption of such communication. It is said that if this system fails to operate satisfactorily a cable will be laid across the lake.

A New Automobile Record.

An article in the *Electrical World and Engineer* describes a run recently made by an automobile from Philadelphia to Atlantic City. The vehicle was built by the Columbia & Electrical Vehicle Company and was fitted with a storage battery made by the Electric Storage Battery Company. The battery consisted of 48 cells, each containing 11 plates. They were arranged in four boxes of 12 cells each. Each box measured 38¼ inches long by 7¾ inches wide by 12½ inches high, and when mounted ready for service the total weight was 980 pounds. The capacity of the battery, discharged at 22 ampere rate, was 154 ampere hours. The motor was mounted in a self contained case pivoted on the rear axle and supported vertically by means of a spring carried on the reaches. This gave the motor a spring suspension and maintained it at all times at the proper distance from the axle to keep the gears in mesh. The motor was series wound, designed for a capacity of 25 amperes at 80 volts and 1000 revolutions per minute. The gear reduction was single, but each rear wheel was driven. The total weight of the vehicle ready for service without batteries was 1200 pounds. The total weight with the batteries was 2180 pounds. The total weight with the passengers and impedimenta, 2600 pounds.

Fig. 2.—End View.

THE DALTON DITCH DIGGING MACHINE.

The controller gave three speeds ahead and two to the rear. The necessary electrical instruments to take the readings desired were located on the foot board and possible of observation at all times. A 28-inch Veeder cyclometer was attached to the front right wheel, so that it could be easily read by the occupant of the right seat.

The record of the run is as follows:

Total distance traveled	100 miles.
Total time consumed	7 hours, 45 min.
Average speed in miles per hour, total time	12.9
Voltage just before finishing 100th mile	78 at 22 amp.
Total kilowatt-hours expended	13.6
Total kilowatt-hours of charge	20.9
Cost of charge at six cents per kilowatt-hour	$1.25
Cost per mile	1¼c.

The best previous record for an electric automobile on one charge of the storage battery was 136 km., or 84.4 miles, at an average speed of 11.6 miles per hour. The weight of the battery was 2000 pounds.

The Chicago Iron Trade in 1899.

BY GEORGE W. COPE, CHICAGO, ILL.

General Features.

A review of the iron trade of 1899 cannot be written without the use of superlatives. Extravagant expressions are necessary. Ordinary phrases do not convey the full meanings of the remarkable events transpiring in this year of wonders. Those who wished for all the business they could possibly handle not only got it, but were offered more. The streams of commerce rose above their banks and the country was flooded. From January to December, in most branches of the iron trade, the flood did not subside, but is still running high. And the long-looked for boom in prices came. It had failed to appear in 1898, although that was a year of steadily increasing demand and great activity in general trade, and a great deal of business for long deliveries was placed at very low prices early in 1899 under the presumption by the sellers that the same conditions would continue and that production was too heavy to permit much of a rise. The boom was not so great as that of 1879-80, prices stopping considerably short of the apex of that phenomenal upward movement, but it was great enough to shatter the prophecies so freely made of recent years that "pig iron will never again see $20 or perhaps even $15." So completely has the trade been upset by the marvelous happenings of the year that men are now prone to rush to the other extreme and express their conviction that never again will the world see such low prices for iron and steel as prevailed in 1897 and 1898. The world at large was never so hungry for iron and steel as in 1899, and its appetite still seems unappeased.

Chicago was as hungry in 1899 as the rest of the world, if not more so. The demand in that market, which had in the previous year far outrun all local sources of supply, became still heavier, and distant producing centers were much more largely drawn upon. Prices at last rose sufficiently high to enable idle works not equipped for cheap production to be repaired and started. Blast furnaces were thus gradually blown in, until now not an idle furnace can be found in the district contiguous to Chicago, while all rolling mills and steel works are running except those which have been dismantled in whole or in part. The productive capacity of all the works has been steadily increased. Improvements have been made in the equipment of steel works and rolling mills to get out a much larger tonnage. But with every piece of machinery strained to the utmost, the wants of consumers have never wholly been satisfied during the year. In fact, at times the operations of manufacturing establishments were impeded by inability to get sufficient supplies of materials. Steel works were forced to shut down for days to await an accumulation of pig iron. Foundries lost considerable time for the same reason. Machine shops and railroad shops had much difficulty in getting the proper sizes of finished iron and steel to make repairs. Famine conditions were thus approached very closely, being especially acute during the summer months, when outdoor activities were being most vigorously prosecuted. As autumn approached a most annoying shortage of cars developed and for this reason supplies in many cases became more precarious than ever, and manufacturing establishments were seriously handicapped. Coal and coke became difficult to get, and rose rapidly in price. The scarcity of coke and its slow delivery through lack of cars made life a burden to furnace owners, whose clamorous customers took no excuses for the failure of a furnace to make its maximum output and keep them constantly supplied.

The causes of the year's activity are not hard to find. Two great interests, agriculture and transportation, enjoyed continued prosperity, while the country as a whole was free from disturbing influences. The Western farmers were so prosperous that their local banks had money to loan in the cities. They paid off mortgages, improved their buildings, bought more implements and indulged in long-desired luxuries. The railroad companies had plenty of agricultural products to haul, enjoyed a free movement of merchandise, carried more passengers, and reported increased earnings every month. They bought all kinds of material more freely, including rails, locomotives, cars, and steel for new bridges. Their purchases were on a grander scale than ever before known, and the manufacturers thus favored gave orders to other manufacturers which were record breakers. Thus a contract for 50,000 tons of bar iron was made at one time, while at another a single order was given for 35,000 tons. The implement manufacturers also purchased and consumed larger quantities of iron and steel than ever before. The Chicago establishments in this line expanded their facilities greatly, to be able to handle the increased trade which poured in on them. With these great interests exceptionally prosperous, the influence of better times was felt in every hamlet and at almost every fireside. Hardware merchants and dealers in house furnishing goods could hardly get their orders filled fast enough. They carried small stocks in 1897 and 1898 because they had no confidence in anything after the shaking out of 1893 to 1896, but they also carried small stocks in 1899 because their goods went out as fast as they came in.

Chicago assumed much more importance in the iron trade in 1899 by reason of its becoming the headquarters of so many of the largest interests in the world in the manufacture of iron and steel. The American Steel & Wire Company, and the American Tin Plate Company had selected the city as their headquarters in the latter part of 1898, but the list was extended in 1899 by the accession of the National Steel Company, the Republic Iron & Steel Company, and the United States Cast Iron Pipe & Foundry Company. The location of the general offices of these companies in Chicago brought to the city a great deal of business and added considerably to its importance as a financial as well as commercial center. The hope had been entertained that the prestige thus acquired by the city would not only be maintained but increased. Unfortunately, however, two of these companies—namely, the National Steel Company, and the American Tin Plate Company, have decided to remove their general offices to New York City.

Considerable expansion of local productive facilities is promised in the next year or two. These improvements are mainly connected with the works of the Illinois Steel Company at South Chicago and Milwaukee, but some wholly new enterprises are contemplated, which may or may not be of considerable magnitude. It is somewhat surprising that, while the establishments in and about Chicago consuming iron and steel have wonderfully increased the production has by no means kept pace with it. Yet the advantages of the city for the assemblage of raw materials and their conversion into marketable forms are of a high order, especially when the proximity of so large a market is taken into consideration. Perhaps the utilization of cheap Illinois coal in the manufacture of a metallurgical coke, which is now being started on a commercial scale, may have a stimulating effect in this direction.

Review by Months.

January opened buoyantly. The trade was electrified by the announcement early in the month that the American Steel & Wire Company, with a capital of $90,000,000, had absorbed nearly every rod mill and wire drawing plant in the country and that the guarantee fund for the company of $38,000,000 had been subscribed five times over. Immediately a heavy demand for wire products set in. Many jobbers had unloaded their entire stock in December expecting lower prices and hastened to replace it at a much higher rate. The tendency of other values was upward. Bar iron was in good demand by car builders, large contracts for structural steel were placed for bridges and buildings, plate mills were in receipt of good orders with inquiries coming from Eastern buyers; wrought pipe was in active demand; large contracts were made for sheets, steel rails were active, tinplate was freely bought at advancing prices, old material was sharply sought, but pig iron was in only moderate demand. Not a weak spot developed in the entire line, as even in the branches disposed to be quiet the works were crowded with orders, and fresh inquiries brought advances. The upward movement of prices was further strengthened by the stiffening of freight rates. Railroad managers withdrew special rates and general tariffs were more evenly maintained. As the months grew older heavy orders were placed for cars, implement works were obliged to buy much more material to cover the ever increasing wants of their trade, and important advances in price were made. Wire products were marked up $3 per ton, beams $2, spring steel 2, and pig iron from 25 to 50 cents.

The market strengthened considerably in February. On the 6th, freight rates on Southern pig iron were advanced 40 cents, making the rate from Birmingham to Chicago $3.50. The Iroquois Furnace changed hands, being bought by a new company named Iroquois Iron Company, in which Rogers, Brown & Co. are heavily interested. The trade this month became excited by the heavy demand for all classes of products, which was phenomenal in some lines. Conditions pointed to a scarcity of raw and partly manufactured products. Amid a general discussion of the undesirability of high prices, advances were made all along the line. Pig iron was marked up 50 cents per ton at a time to $1 and $1.50 on various grades; bars, $2; hoops, $3; plates, $1; steel rails, $3; sheets, $4; structural shapes, $2; merchant steel, $3; wire products, $4; tin plate, $10, and wrought pipe, 10 per cent. Old material was also in sharp demand, but dealers bought more heavily than consumers. The National Steel Company purchased a number of steel plants in Ohio and arranged for headquarters in Chicago. A movement was begun to consolidate the Western bar iron mills and another to bring all the sheet mills under one corporation.

Increased scarcity was experienced in March in all materials and products. Prices advanced from week to week. The total advances for the month were $8 on wire products, $2.50 to $3 on pig iron, $5 on bars, $10 on hoops, $7 on plates, $9 on sheets, $4 on merchant steel, $2 on steel rails, $3.50 on old iron rails. Conservative men, who had been endeavoring to resist the upward movement, began to realize that they might be heavy losers by carrying their policy too far. Pig iron consumers bought heavily for deliveries running through the year and into 1900, until furnace companies took alarm at the forward business thus being placed and restricted sales to deliveries prior to July 1. This caused heavier purchases for early delivery, consumers believing it would be better to pay interest on stock bought in advance of their needs than the higher prices which appeared inevitable. Important contracts went begging for some one to fill them. The month ended with a most active demand for bars, plates, structural shapes, wrought pipe, sheets, all kinds of car and railroad material, but a little quieter in pig iron. Old material was weak, owing to a lack of buyers. The approaching consolidation of bar mills kept them out of the market for raw materials.

April opened with but a moderate demand for pig iron, which was regarded with satisfaction by furnace companies, whose position was getting uncomfortable owing to the pressure for more rapid shipments on contracts. The organization of the Republic Iron & Steel Company was completed and practically all the bar iron mills west of Pittsburgh were thus concentrated under one ownership. The American Steel Hoop Company also absorbed the mills rolling hoops. The sheet consolidation, however, could not be accomplished, although sheet mills took few orders, awaiting the outcome. This month was marked by heavy contracts placed for cars and bridges by railroad companies. While general trade was less active, prices continued to advance. Bars were marked up $1, hoops $3, wire products $4; structural shapes $2, plates $10, sheets $5, steel rails $1, and merchant steel $2. Spelter rose to 6.40 cents per pound, greatly stiffening the prices of galvanized products.

The pig iron trade was exceedingly active in May. Larger transactions were reported in a single week than the entire business of the previous two months had aggregated. The location in Chicago of the headquarters of the Republic Iron & Steel Company and the United States Cast Iron Pipe & Foundry Company was responsible for a heavy addition to the local pig iron trade, but all other consuming interests bought heavily and transactions would in any event have been of large proportions. Furnace companies removed the time restriction on sales and large contracts were booked for deliveries running into 1900. Pig iron was marked up 50 cents to $1 from week to week, the total advance for the month being $2 to $3. The supply of Lake Superior charcoal became very scarce, owing to the demand from malleable foundries. The rail mills took good orders for steel rails, and their entire output was sold up to November. Advances made on manufactured iron and steel footed up $2 on bars, $5 on hoops, $2 on wire products, $8 on plates, $5 on sheets, $1 on merchant steel. Wrought pipe also scored a heavy advance, the list being adjusted on a new basis. Spelter rose to 6.80 cents per pound in carload lots. Old material receded from $1 to $2 per ton, as large consumers were out of the market.

All manufactured products were extremely scarce in June, the demand running in excess of the supply. Buyers accepted the high prices now ruling with better grace than the first slight advances, their main desire being to get what they needed even if they had to pay for it roundly. Enormous transactions were reported, among them an order for 35,000 tons of bar iron, the largest of the kind ever known up to this time. The sheet mills took contracts more freely, as the prospects of the consolidation looked less promising, but prices stiffened instead of weakening, because of the high rates ruling on steel billets and sheet bars. Implement manufacturers, who had deferred placing their usual season contracts in the hope that prices would be lower, began to cover their requirements. A few bought all the bars, sheets, plates, bolts, shapes, &c., to cover their needs for a year, but many made contracts for only part of their wants. Nevertheless, the business of this character was enormous, as the implement manufacturers in all cases anticipated a great increase in their own trade. Steel rails began to be sold for December delivery. The demand for pig iron was of large proportions until the close of the month. Southern freight rates advanced 50 cents on the 19th, and 15 cents on the 30th, making the rate $4.15 from Birmingham to Chicago. The long idle Minerva Furnace at Milwaukee was blown in. The advances this month, made at intervals, totaled $5 on wire products, $3 to $4 on pig iron, $2 on bars, $5 on structural shapes, $4 on hoops, $7 on plates, $3 to $4 on sheets, $3 on rails, $5 on merchant steel, and $1 on old iron rails. Spelter receded to 5.85 cents per pound. Wages of tonnage men in iron rolling mills were settled for the ensuing 12 months on a basis of 25 per cent. advance, thus insuring no stoppage of the mills, which would have been a serious matter at this period of activity, when every pound they could turn out was needed.

The last half of the year opened with a buoyant condition of general trade. Mills and factories of all kinds were so crowded with work and so far behind in deliveries on contracts that their customers had representatives on the ground to see that shipments were being sent forward as rapidly as possible. The scarcity of finished iron and steel brought inquiries to Chicago in July from points as far distant as New England. Pig iron continued quite active with sales steadily booked for deliveries into the third quarter of 1900. Malleable Bessemer became very scarce, and charcoal furnaces were continually called upon to supply iron for malleable foundries. The Calumet Furnace, regarded for several years as an abandoned plant, was blown in, but afforded the market no relief, as its product for a year had been previously sold. The furnace at Spring Valley, Wis., was also started after a long rest, with a well filled order book. Big orders were placed for bridges, and the demand for cars kept up. The advances during the month made a total of $1 to $2 on pig iron, $1 on bars, $5 on sheets, $1 on hoops, $3 on structural material, $2 on wire products, $2 on rails and $10 on tin plate. The wages of tin plate workmen were advanced 15 per cent. for the coming year, and tin plate prices were readjusted to cover the higher cost of labor and material. Spelter improved to 6.12½ cents and reacted to 5.90 cents. Plates became a little easier toward the close of the month, as idle mills began to get to work, increasing the supply.

August found the market still in the control of sellers. Furnaces and foundries were hampered by a decided scarcity of coke. The increasing railroad traffic also caused a scarcity of cars, which continued with more or less severity for the remainder of the year. Pig iron was in active demand, and the country was reported to be swept clean of all stocks, even unsalable grades at long idle furnaces being eagerly snapped up wherever found. The local steel works ran short of metal, and were forced to buy heavily in other producing districts. Sales

of bars continued heavy, the output of the largest manufacturers being disposed of up to January. The Republic Iron & Steel Company added to their property the Union Steel Company of Alexandria, Ind. Plates grew firmer, the additional production of newly started mills having apparently been easily absorbed. Orders for cars were large. The demand for rails was greater than the mills could supply in the season for track renewing. The advances this month were 50 cents to $1 on pig iron, $5 on merchant steel, $6 on bars, $1 on plates, $2 on hoops, $5 on structural shapes, $5.50 on tin plate and $3 on old iron rails. Scrap was in strong demand, and prices rose considerably. Sheets were fairly active, but prices receded $2, afterward regaining half of the decline. Spelter fell to 5.75 cents.

The rush of business was so great in September that stories of the postponement of large undertakings because of excessively high prices had no effect. It was argued that such postponements merely constituted a reserve demand, which could be relied on later. The volume of transactions in pig iron continued at the previous high level. Big car orders were placed, filling car shops with work far into the future. The great advances in old material excited the dealers, and the country was scoured for accumulations of scrap as it had not been for years. The rail mills began to quote for 1900 deliveries, naming $33 minimum for large lots. The advances this month were $3 to $3.50 on pig iron, $6 on wire products, $3 on bars, $9 on plates, $4 on open hearth spring steel, $1 on sheets and $7 on old iron rails. The effort to consolidate the sheet mills was revived, but the market for sheets began to be disturbed by the unloading of stocks from second hands at lower than mill prices. Spelter declined to 5.37½ cents. The National Tube Company this month absorbed nearly all the wrought pipe and tube mills.

October was another month of enormous business, chiefly with railroads or interests related to them. The rail mills notified railroad companies that an advance on rails would soon be made, and gave all who cared to avail themselves of it an opportunity to place their orders for 1900 at $33, Chicago, and corresponding prices elsewhere. A huge tonnage was speedily booked, assuring the mills of continued activity next year and relieving the billet trade from apprehension in that quarter. Rails were then advanced $2. The other leading features of this month's trade were, briefly, a continued shortage of coke, a worse car famine, large transactions in pig iron, a heavy demand for bars, but a falling off in business in plates, sheets and other finished products. Old iron rails and other forms of scrap reached their hight this month, and then began to decline. The advances in prices were $3 on wire products, 50 cents on local and charcoal pig iron, $2 on steel rails. Sheets declined from $2 to $3 and spelter fell to 5.35 cents.

Freight rates on Southern pig iron were advanced 20 cents in November, and prices were marked up to correspond, while local pig iron made a gain of 50 cents. Sales were heavy, car builders and car wheel makers being large buyers. The car orders placed this month surpassed in size anything previously known. A new record was also made in bar iron sales, a single order calling for 50,000 tons. Implement manufacturers were also large buyers of bar iron. Good orders were placed for railroad bridges, but the demand from the building trade fell off. The attempt to consolidate the sheet mills was abandoned, and prices of sheets weakened, as the dull season in this line had been entered. Plates also began to drop. The declines this month were $5 on plates, $3 on sheets and $5 on old iron rails, but wire products were advanced $1.60. Spelter fell to 4.25 cents.

December found a general disposition among buyers to talk lower prices. The weakness in a few finished products afforded a basis for such arguments, but they were not generally effective. Even sheets showed considerable resisting power, and contracts could not be placed at the lowest rates openly reported as current in the trade. Plates gave way $2 or more, but in this line prices had been out of all proportion with other products, and a readjustment seemed natural. In a general way the month was quiet, although far from dull, as a steady run of small orders was observed, indicating that consumers had by no means covered their requirements, and were being driven by their necessities to make frequent purchases of material. The year closes with heavy orders booked for forward delivery at prices which are remunerative to manufacturers beyond anything known at the close of any previous year since 1879.

Tables of Prices.

The changes made in prices during the year were frequent, and sometimes were startling in the leap made to a higher level. It is sufficient for the purpose of this review to present a record of the course of prices on some of the leading commodities from month to month. A comparison is made in each case with the prices prevailing in previous years, the comparison usually running back to 1890.

Pig Iron.—The course of prices on some leading grades during the past ten years is shown in the following table of prices at Chicago, averaged from quotations in our weekly trade report:

Months.	Local coke No. 1.	Lake Superior charcoal.	Ohio strong soft No. 1.	Southern coke No. 2.
January	$11.50	$11.50	$12.00	$11.10
February	12.50	12.50	13.00	12.75
March	14.00	15.75	15.50	14.50
April	15.50	17.00	17.00	15.50
May	16.00	17.25	17.25	15.50
June	18.00	19.50	19.50	17.75
July	19.50	21.50	20.80	18.90
August	20.75	22.50	22.75	19.40
September	22.50	24.25	24.00	21.65
October	23.50	25.00	24.50	21.65
November	24.00	25.50	24.75	21.85
December	24.50	25.50	25.00	21.85
Average for year	$18.50	$19.80	$19.67	$17.75
Average for 1898	11.50	11.60	12.00	10.45
Average for 1897	11.10	13.00	12.25	10.25
Average for 1896	12.20	13.62½	14.50	11.40
Average for 1895	12.25	13.75	14.25	11.75
Average for 1894	11.25	14.75	13.50	10.75
Average for 1893	13.75	16.12½	16.00	12.75
Average for 1892	14.50	16.75	16.75	14.00
Average for 1891	15.50	17.37½	18.00	15.00
Average for 1890	17.50	20.75	20.00	15.25

Finished Iron and Steel—The following table shows the course of prices for the past ten years on several kinds of finished iron and steel, averaged from our quotations on mill shipments, Chicago delivery:

Months.	Common bar iron.	Soft steel bars.	No. 27 common sheets.	Angles.	Smooth machinery steel.	Open hearth spring.
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
January	1.05	1.15	2.00	1.40	1.55	1.60
February	1.15	1.20	2.35	1.40	1.60	1.75
March	1.45	1.50	2.45	1.55	2.10	2.25
April	1.57½	1.60	2.80	1.75	2.40	2.40
May	1.62½	1.70	2.95	1.75	2.40	2.50
June	1.80	1.90	3.05	1.90	2.55	2.85
July	1.85	2.00	3.15	2.15	2.70	3.20
August	2.00	2.20	3.20	2.25	2.90	3.20
September	2.25	2.30	3.25	2.40	2.95	3.50
October	2.30	2.35	3.15	2.40	2.95	3.60
November	2.30	2.40	3.10	2.40	2.95	3.60
December	2.30	2.35	3.00	2.40	2.95	3.60
Average for year	1.80	1.90	2.85	2.00	2.50	2.85
Average for 1898	1.05	1.10	2.02½	1.25	1.55	1.61
Average for 1897	1.11½	1.13	2.07	1.19	1.53	1.66½
Average for 1896	1.30	1.30	2.28	1.40	1.62½	1.87½
Average for 1895	1.25	1.37½	2.50	1.50	1.70	1.85
Average for 1894	1.10	1.25	2.40	1.40	1.70	1.85
Average for 1893	1.47½	1.60	2.82½	1.82½	2.00	2.05
Average for 1892	1.62½	1.75	2.90	1.97½	2.11	2.09
Average for 1891	1.70	....	2.95	2.17	2.32	2.40
Average for 1890	1.82	....	3.17	2.37½	2.70	2.75

Steel Rails.—Greater conservatism was shown in this branch of the steel trade than in any other. The manufacturers had the opportunity to advance their prices to extravagant figures, as they could have turned their steel into other forms yielding greater profit than rails if the railroad companies had refused to pay a high rate for them. But they maintained remarkably reasonable figures for rails, as compared with the prices of other steel products, and made very moderate advances from month to month. The mills were crowded with work during the entire year, the local mills making but a short stop in February for repairs and improvements in the steel converting department. These improvements enabled a much greater tonnage of steel to be turned out, the increased output adding greatly to the satisfaction of both the manufacturers and their customers during the year. A heavy business was done in rails of sections under 45 pounds. The local mills were frequently far in arrears on deliveries of such rails, owing to the great activity in the mining and lumber districts. Shipments were made quite regularly to mines in the vicinity of Pittsburgh, as the Pittsburgh mills had more business than they could handle. Contracts for heavy sections for next year were pretty generally placed by railroad companies in September and October, the aggregate tonnage thus booked having run far in excess of any previous experience of the kind. The following table shows the course of prices on heavy rails at Chicago, averaged from weekly quotations on large lots:

Months.	Price.	Months.	Price.
January	$20.00	July	$30.00
February	22.75	August	31.00
March	23.75	September	32.75
April	25.75	October	33.25
May	26.00	November	35.00
June	27.50	December	35.00

The average price for the year was $28.50, as compared with $19 in 1898; $19 in 1897; $29 in 1896; $25.50

in 1895; $25 in 1894; $29.50 in 1893; $31.17 in 1892; $31 in 1891, and $34.50 in 1890.

Steel Billets.— The following table gives the fluctuations in billet prices at mill near Chicago in the past five years:

Months.	1895.	1896.	1897.	1898.	1899.
January	$16.50	$18.50	$18.00	$17.50	$18.25
February	16.50	20.00	17.50	17.50	20.00
March	16.50	19.50	18.00	17.50	24.25
April	17 00	21.25	16.50	17.25	25.50
May	19.50	21.25	16.50	16.50	28.00
June	20.00	21.25	16.00	16.25	33.00
July	22.50	21.25	15.00	16.00	38.00
August	23.00	21.25	15.75	16.25	38.00
September	26.00	21.25	16.75	17.25	41.00
October	26 00	21.25	18.00	17.00	40.00
November	No sales.	21.25	18.00	17.00	39.00
December	No sales.	21.25	17.50	17.25	37.00
Average for year.	$20.35	$20.00	$17.12½	$16.95	$31.85

Wire Rods.— The range of prices of wire rods at mill near Chicago in the past five years is exhibited in the following table:

Months.	1895.	1896.	1897.	1898.	1899.
January	$23.00	$26.50	$24.25	$26.25	$24.00
February	23.00	27.50	24.00	25.25	27.00
March	23.00	26.50	24.00	24.75	32.00
April	23.00	30.00	23.00	22.75	33.25
May	26.00	29.50	22.50	22.75	35.00
June	26.00	27.50	22.00	22.25	42.00
July	27.00	27.50	21.00	21.25	45.00
August	31.00	27.50	21.00	21.50	45.00
September	34.00	27.00	24.00	22.50	50.00
October	34.00	27.00	26.00	22.50	.....
November	No sales.	27.00	25.00	22.50	50.00
December	No sales.	27.50	25.00	22.50	.....
Average for year.	$27.00	$26.75	$23.50	$23.00	$38.35

Steel Tank Plates.— The local production of steel plates was greatly augmented in 1899 by the completion early in the year of a fine slabbing mill of large capacity by the Illinois Steel Company. The increased output thus secured was most timely, as the demand for plates was extraordinary, carrying prices far in excess of those prevailing on other forms of steel. The following table shows the course of prices on steel tank plate, mill shipments, Chicago, averaged from weekly quotations in our market report:

Months.	Price. Cents.	Months.	Price. Cents.
January	1.30	July	2.90
February	1.45	August	2.75
March	1.80	September	3.00
April	2.35	October	3.15
May	2.45	November	2.95
June	2.85	December	2.80

The average for the year was 2.50 cents.

Old Material.— Consumers appeared to be better able to control prices of scrap in 1899 than in previous periods of great activity. Values advanced considerably, but not in the same ratio as finished products. The course of prices at Chicago on leading varieties in the last ten years is shown in the following table, averaged from weekly quotations:

Months.	Old iron rails. Gross ton.	No. 1 railroad wrought. Net ton.	No. 1 cut mill scrap. Net ton.	Heavy cast scrap. Net ton.
January	$13.00	$11.75	$7.00	$8.25
February	14.00	12.00	7.75	9.00
March	16.25	14.00	8.75	11.50
April	18.00	16.00	9.00	12.00
May	18.50	16.00	9.00	11.50
June	18.00	15.50	8.75	11.50
July	18.75	16.00	8.50	12.00
August	21.00	16.00	9.00	12.50
September	27.50	19.00	13.00	15.00
October	30.00	23.50	14.50	16.00
November	30.00	24.00	13.50	15.50
December	27.00	23.50	13.00	14.00
Average for year.	$21.00	$17.25	$10.15	$12.40
Average for 1898.	12.37½	11.25	6.62½	8.15
Average for 1897.	11.67	10.60	6.44	7.25
Average for 1896.	13.50	11.20	7.00	8.48
Average for 1895.	14.12½	11.08	7.67	8.37½
Average for 1894.	10.83	8.80	6.85	7.50
Average for 1893.	16.25	12.75	9.25	10.00
Average for 1892.	19.10	15.75	11.17	11.66
Average for 1891.	22.75	18.35	13.75	12.25
Average for 1890.	25.00	19.75	15.62	13.37½

Old car wheels, which had ranged from $10.75 to $11.50 per gross ton in 1898, rose to $12 in January, 1899, $13 in February, $15 in March, $15.50 in May, $15.75 in June, $19 in September, $20 in October, and $21 in November, standing at the same figures in December, and averaging $16.50 for the year.

Heavy melting steel scrap, which had shown but slight fluctuations in 1898, raging from $7 to $8 per gross ton, started in at $7.75 in January, 1899, advanced to $8 in February, $10 in March, $10.50 in April, $12.50 in June, $13 in July, $14 in August, $17.25 in September, $18 in October, and $18.50 in November, receding to $18 in December, and averaging $13.25 for the year.

Conclusion.

The outlook for next year is decidedly encouraging for all interests connected with the iron trade. Some readjustments of prices may be made, as it is improbable that rates realized on quantities needed for sharp delivery can be maintained on contracts of the usual character for future shipment. But buyers are likely to find themselves again at the mercy of sellers if they wait too long for prices to fall before covering their requirements. The country is now prospering as never before, the consumption of all products exceeds anything previously experienced, and, besides, a strong foundation has been laid for the coming year in the great amount of business already placed at good prices for pig iron, steel rails, plates, structural material, car material, &c. The iron trade in other countries is also in good condition, with the output for the coming year well covered by contracts, so that America is more likely to be called upon to help out the foreign shortage than to be invaded by a surplus European product seeking a market here. The steadily increasing production is expected eventually to have an effect on the market, but no one can foretell when it will be too great for the demand. The experience of the past year has caused men to lose faith in their own judgment. The conservative man, the one who constantly expected that the reserve capacity being brought into line would surely flood the market, was a financial loser. Hence a sharp recurrence of buying for spring requirements, to be expected at any time after the middle of January, may cause a stampede among buyers. But, whether that happens or not, the fact seems clear that 1900 will be a year of prosperity throughout the iron trade.

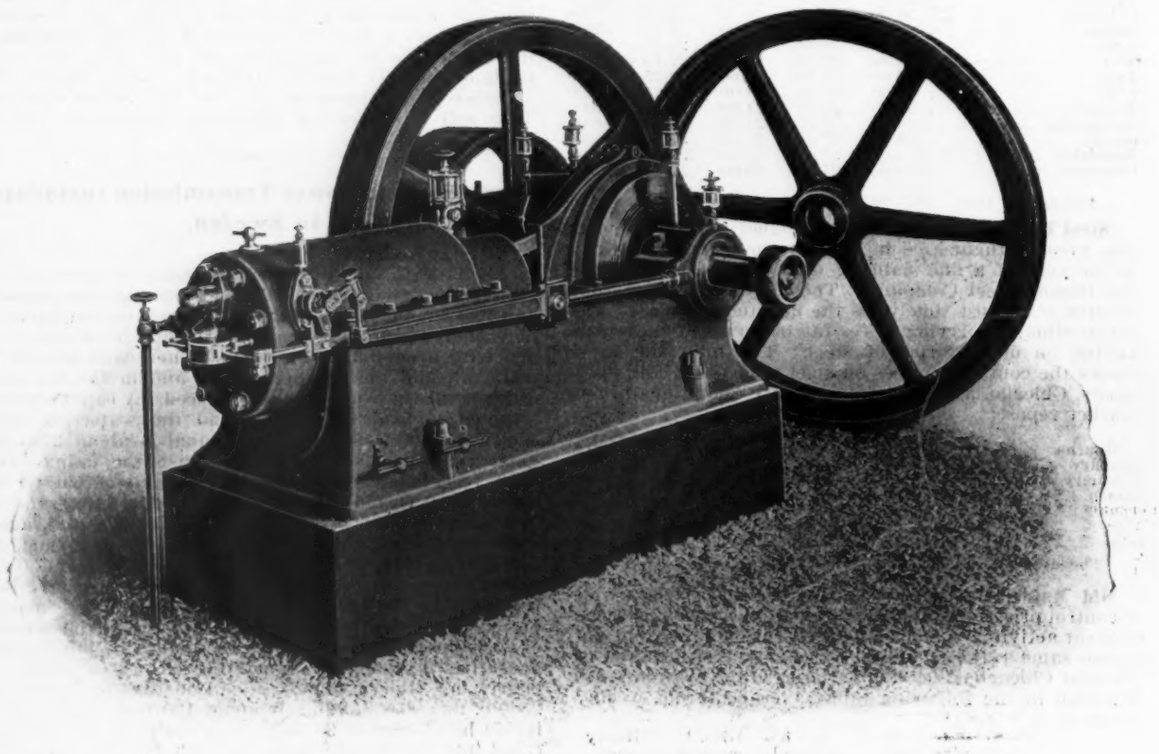
Large Electric Power Transmission Installation in Sweden.

The large Ljungan waterfall at Olby, Sweden, is, says *Engineering*, about to be utilized for industrial purposes, and this has necessitated extensive and interesting works of various nature. A company were formed some time ago with a capital of 2,000,000 kroner, who bought the waterfall and the adjoining land, and in the beginning of last year the work was commenced. A canal was constructed to lead the river round the waterfall, above which a dam was built. The canal is about 2700 feet long, and consists of three sections: the influx canal, 2000 feet long; the passage from this down to and through the turbine house, about 170 feet long; and the exit canal, some 500 feet long. The influx canal, again, consists of three portions, of which the lower part, 500 feet long, is built of stone, being rather more than 30 feet broad and deep. About 15,000 c. m. of stone have been required for the building of this canal, and the making of the upper end of the canal has entailed the removal of 30,000 c. m. of earth. Also the building of the turbine house has necessitated extensive removals of earth (10,000 c. m.), and it stands on a concrete foundation of 2500 c. m. The building is about 130 feet long, and the inside hight is over 60 feet. The water is led from the canal into the turbine house through five pipes of 6 feet diameter, and two of about 8 feet diameter. In addition to these, there are several reserve pipes, which can be taken into use without much additional cost, should the erection of new industrial establishments make them desirable. The dynamos will be direct coupled to the turbines, and the electric power will be conveyed direct from there to the work shops. The water power, which can be made available without interfering with that part of the stream which must be left intact, amounts to some 12,000 horse-power. About half of this power will be required for the two large factories: Olby Electrochemical Company, and Olby Calcium Carbide Company. The latter is situated on the east, and the buildings of the former on the west side of the canal. The Olby Electrochemical Company will manufacture chloride of potash according to a new process.

Test of Fire Proof Ceiling.

A fire test of a fire proof ceiling was made at the testing plant of the British Fire Prevention Committee in London on July 26, 1899. The construction of the ceiling was as follows: The main members were 3 x 9-inch wood joists, spaced 19 inches apart c. to c., and resting on brick walls 4½ inches at each end. There were two joists spiked together in the center of the hut. At both sides at the end of each joist, and screwed thereto, was a slag wool slab, 1 inch thick, 5 inches wide, and the full depth of the joist. On the top of the joists, and forming a floor, was ⅞-inch beaded boarding, tongued and grooved, nailed with 2½-inch floor brads, two nails to each joist. One board in the middle of the floor was then screwed down so as to be removed for inspection. Slag wool slabs 1¾ inches thick (reduced to 1½ inches thick when pressed into position), were

fixed to the under side of the joists, covering the entire area of the hut and projecting down the walls all round about 3 inches, secured to the joists with 3¼-inch screws and washers. The screws were inserted in asbestos tubes 1½ inches long. The slag wool slabs comprised slag wool inclosed on both sides with galvanized wire netting of No. 19 gauge and 1-inch mesh. The slabs were made so as to butt against each other at the double joists in center, and the whole of the slag wool ceiling was then covered with ⅞-inch tongued, grooved and beaded boarding, nailed through the slabs to the joists with 4-inch wire nails. Round the walls of the hut a wood molding was fixed, forming a cornice and covering the slag wool which projected below the boarded ceiling. The space at the end of each joist was grouted in with fire clay, and the space between joists on the set-off was filled in with brickwork. The test was a fire rising to 1800 degrees F. in one hour, followed by the application of a stream of water for two minutes. At the conclusion of the test the flooring over the ceiling was uninjured. With the exception of one small hole the joists were not burned.



THE FENNER ELECTRIC LIGHT GAS ENGINE.

The Fenner Electric Light Gas Engine.

The gas engine illustrated was designed by J. B. Fenner, who is well known for his work in this branch of engineering. The engine is being built by the J. W. Ruger Mfg. Company of Buffalo, N. Y. It is a single cylinder horizontal automatic cut off, graduated charge engine, that will produce as steady motion as a steam engine. It may be either direct connected or belted to a dynamo without a jack shaft or a fly wheel on the armature.

The engine is controlled by an inverted governor of a new type connected by a rod to an automatic cut off, graduated charge valve made with proper size openings for the inlet of gas and air. The valve is so constructed that it admits the proper proportions of gas and air, whether working on full load or part load, so that the richness of the charge is the same at all times. The valve cuts off both gas and air proportionally at the same time, by the action of the governor, which acts instantly on any variation of the load. The charge is fired by a spark igniter, so designed that it has a wiping motion, with just enough contact to cause a spark at the proper time. The insulated pole can be removed instantly to clean or reverse it and can be replaced very quickly, the small wear on it making it long lived. The sparker is driven by an eccentric, keyed to the crank shaft of the engine, yet making but one turn while the shaft makes two turns, thus timing the sparker perfectly and doing away with all gearing or cams. This eccentric also opens the exhaust valve at the proper time, holds it wide open just half of the time between the explosions, thereby giving ample time for all the burnt gases to be expelled, leaving a clean cylinder for the next charge of gas and air. There are, therefore, no burnt gases to be mixed with the incoming charge. The engine takes a charge every second turn of the crank, either light or heavy, as the load may require, there being no false charges or misses, consequently the speed is regular. Every part of the engine requiring it is lubricated by automatic oilers, and all the bearings are so constructed that no oil is wasted or scattered. All the working parts are interchangeable and easily adjusted. Any one device can be removed without disturbing another. The crank shaft is made with balanced disks on the crank. The exhaust is conveyed to a muffler near the engine, that deadens all sound, and no noise is heard at the outer end of the exhaust pipe.

The illustration represents a 12 horse-power engine, which is made either direct connected to the dynamo or for belt driven dynamo, as may be desired. All sizes larger than 12 horse-power are made with two or more cylinders, upright type, and are direct connected or belted to the dynamo. In a test of the 12 horse-power engine driving a full load with natural gas, the consumption of gas was from 10 to 12 feet per horse-power per hour, and on a test wtih illuminating gas of 18 candle-power it was 16 feet per horse-power per hour.

A number of capitalists, including A. H. Sisson, W. S. Wright, H. S. Sands and Paul O. Reymann of Wheeling, and C. E. Krebs, president of the Jewett Car Company, at Jewett, Ohio, have organized a company who will manufacture steel cars at Newark, N. J. The plans of the concern have not fully developed, but they will make steel railway cars by a new process and under new patents recently taken out by one of the parties.

The Pennsylvania Railroad officials are conducting a very full investigation into the extent of the injuries received by a number of steel cars which were in a severe wreck that occurred on that line between Plainsboro and Princeton Junction, N. J., December 13. The result of this investigation will be looked forward to with much interest, for definite data as to the extent of injuries such cars receive and the expense of repair thereof will do much to settle opinion upon this feature of the steel car.

The Pittsburgh Iron Trade in 1899.

BY ROBERT A. WALKER, PITTSBURH, PA.

The year just drawing to a close will go down in history as being the greatest year the iron trade has ever known, both in volume of business and in profits. It has been a year full of sensations, tremendous activity, extraordinary advances in prices, and records in every department that will probably stand without parallel for many years to come. There is not a single person connected with the iron trade in any capacity who can consistently say "I told you so" when the events of the year 1899 have been gone over and reviewed. It is true that at the close of 1898 all indications pointed to an active year in 1899, and one that would probably be very profitable. This opinion was shared by the trade in general, but no one was prepared for the tremendous activity that characterized nearly the whole year, and the unprecedented advances that took place in prices. In a review of the Pittsburgh iron trade for 1898, printed in *The Iron Age* of December 29, last year, under the heading of "Outlook for 1899," we said:

The unprecedented demand for iron and steel which has come to the mills in December, always the dullest month in the year, is simply a forerunner of what is to come in 1899. The outlook could hardly be better. Already there have been fully 1,000,000 tons of rails sold for next year, and the requirements promise to be double that amount. Our pig production in 1898 has been over 11,000,000 tons, and in 1899 it will likely be over 12,000,000 tons. It does seem that next year there will be enough tonnage to keep every well equipped manufacturing establishment full of work, and it should prove to be by all odds the best year in the history of the iron trade.

That this prophecy was more than true the record of the past year will amply prove. The maximum capacity for production was employed during the entire year, prices on pig iron, billets, and all forms of finished material advanced anywhere from 100 to 250 per cent., and the year 1899 in the iron trade has simply been without parallel, no matter from what standpoint it is viewed. We entered 1899 under very favorable conditions, the volume of tonnage being large, prices firm, and the mills fully employed. The year had not very far advanced until it became apparent that there was an unusual rush of activity, and prices commenced to soar skyward. The year was not more than half over until there was a famine in nearly all kinds of iron and steel products, and it was not a question of price, but where to get material. This condition continued until early in October, when the tremendous output of the mills commenced to tell, and production had about caught up again with demand. In the last quarter of the year there was some easing off in prices, particularly in finished products, such as plates and two or three other lines, prices on which had been carried abnormally high by the tremendous demand, which was far ahead of supply. From the standpoint of profit it has undoubtedly been the best year the iron trade has ever had. Many of the finishing mills made contracts for raw material late in 1898 and early in 1899, before the full force of the boom was felt, deliveries on which ran through the entire year, and which to the buyers proved afterward to be the making of large fortunes. It is current gossip in the trade that the Carnegie Steel Company, Limited, will close the year with a balance on the right side of the ledger of more than $20,000,000, and it may be a much larger sum than that. Other large interests, such as National Steel Company, Jones & Laughlins, Limited, American Steel & Wire Company, American Tin Plate Company, American Steel Hoop Company, and the smaller concerns, have all made much money, and will close their books for this year with profits very much larger than were ever dreamed of by the parties who organized those great concerns.

The Consolidations.

In the early part of 1899 a craze swept over the country for consolidations in all lines of business, and for a time it was easy to float any scheme on the market, at whatever capitalization the promoters saw fit to give it, the public eagerly buying the stock and making tremendous profits for those who were instrumental in organizing these concerns. In the latter part of 1898 the American Steel & Wire Company had secured control of all the principal wire rod, wire nail and wire mills in the United States, with the exception of three or four of the principal ones, these being Shenango Valley Steel Company Oliver Wire Company, Oliver & Snyder Steel Company and Pittsburgh Wire Company, all in the Pittsburgh district. The year 1899 had not advanced more than a week or two until these concerns were taken over by the American Steel & Wire Company, giving that great corporation a practical monopoly of the wire rod, wire nail and wire trades in the United States. The only concerns on the outside in the Central West manufacturing rods and wire nails for the open market were the Ashland Steel Company, at Ashland, Ky., and their constituent interests, the Belfont Iron Works Company and Kelly Nail & Iron Company, both making nails. The year had not very far advanced until a move was started to consolidate the sheet mills. This, however, was not successfully put through, the options having expired on November 1 and not being renewed. The bridge builders throughout the country, the concerns making tubular goods, the hoop and cotton tie mills and the bar mills were all interested at this time in consolidations which would place each of these interests into one great company. After serious delays the National Tube Company were organized, taking over 13 or 14 of the principal pipe and tube mills in the United States, the only concerns of any size remaining on the outside being Spang, Chalfant & Co., A. M. Byers & Co., Inc., both of Pittsburgh, and the Reading Iron Company, Reading, Pa. The Republic Iron & Steel Company, after a good deal of difficulty, principally in financing the deal, were finally organized, taking over 34 of the leading bar mills in the West. The American Steel Hoop Company were organized with astonishing celerity, with a capital of $19,000,000 common stock and $14,000,000 preferred, the latter guaranteeing 7 per cent. dividends, and took over seven or eight of the leading hoop and cotton tie mills. By May 1, however, a greater consolidation than any yet perfected was attempted, when Judge W. H. Moore secured from Andrew Carnegie an option on the Carnegie interests, paying about $1,250,000 for it, which, as subsequent events proved, was a clear profit to Andrew Carnegie. The trade are familiar with the attempts made to reorganize the Carnegie Steel Company and their various interests, including the H. C. Frick Coke Company, into one great concern with $100,000,000 bonds, $250,000,000 preferred stock, and $275,000,000 common, in addition to a very large cash bonus, which was to have been paid to Andrew Carnegie. This deal hung fire all through the summer months, and was not finally declared off until fall, when it became apparent that owing to the stringency in the money market, and the fact that the bankers were not favorably disposed to the scheme, it was finally abandoned. The trade will recall the efforts of H. C. Frick and Henry Phipps to close up the transaction abroad, but without success. The recent retirement of H. C. Frick as chairman of the Carnegie Steel Company is regarded as the natural outcome of the failure of his efforts to organize the Carnegie Company and purchase the interests of Andrew Carnegie. However, other consolidations that were attempted during the

year have been given up, and it seems as though the day for huge consolidations in the iron trade, and in other trades as well, has gone by. We cite as instances the failure to complete the bridge company and also the sheet deal, both of which, we understand, have been abandoned for the time being at least. The consolidation of so many interests in the iron and steel trade is variously regarded by those interested; but it is the belief of the conservative element in the trade that these huge consolidated companies, while overcapitalized, are simply the outgrowth of the evolution of trade, and will continue for a good many years to come. By this we do not mean that those concerns who at the present time have a practical monopoly of their particular lines of product, such as tin plate, sheet bars, rods, wire and wire nails, will not have opposition, for such is not the case. Already new concerns to manufacture these lines of products are creeping in, and some large plants are already in course of construction. There is one thing certain, and that is that the large concerns which have been organized in the iron and steel trades will have the effect of holding up the market in times of depression, and that it is not likely we will get back again to $10 Bessemer iron, $15 billets, and finished product on the same basis, for some years to come.

Foreign Trade.

The wonderful domestic demand for iron and steel products of all kinds which we have had during the year 1899 has prevented our manufacturers from making attempts to extend their foreign trade. It is true that a good deal of our products are being sent to the other side right along, and will continue to be, but the volume of tonnage sent abroad this year will not compare favorably with that of last year, for the simple reason that it was impossible for our manufacturers to take care of the home demand. It has not, however, by any means been given up, for when consumption in this country is again below output our surplus product will be sent to the other side, as it has been in the past. It is the policy of the large consumers like Carnegie Steel Company, National Steel Company and others to operate their plants in full, and if our home markets are unable to take care of the output the balance will be shipped out of the country.

New Construction.

There has been a very heavy increase in capacity of the large plants in and about the Pittsburgh district during this year. When it became apparent that the demand was going to be unprecedented, the mills and shops set about to increase their capacity as much as possible, to take advantage of the good times and the high prices. In the Pittsburgh district the Carnegie Steel Company, Limited, have made greater additions to their capacity than any other concern. A new open hearth department has been completed at Homestead, the great plate mills bought from the Bethlehem Steel Company have been set up in Homestead and are in operation, while only about 60 days ago this great concern decided to build two new blast furnaces at Carrie, a new open hearth plant of 14 50 ton furnaces at Duquesne, and also a new blooming mill. Jones & Laughlins, Limited, have been at work all this year rebuilding their three Eliza furnaces and also erecting a fourth one. This concern will have before the close of 1900 one of the finest blast furnace plants in the world. It will consist of four new stacks, each 100 feet high and each capable of turning out 600 tons of metal per day. In addition they own the Soho Furnace, good for about 300 tons a day, so that this concern will be able to make, before the close of next year, between 2500 and 3000 tons of pig iron per day, all of which will be used in their own Bessemer and open hearth plants. They have plans under way for a hot metal route across the river from their Eliza furnaces to their mills on the South Side. In the Mahoning Valley the National Steel Company have just about finished two large blast furnaces, which were illustrated in *The Iron Age* of December 21. They have commenced work on a third, while in the Shenango Valley the Sharon Steel Company have started work on a new large stack, open hearth plant and rod mill. Coming back again to the Pittsburgh district, the American Steel & Wire Company have some great plans under way, which, when carried out, will mean the building of six large new blast furnaces, great Bessemer steel works, rod mills, wire and wire nail mills on Neville Island, the concern having recently bought over 350 acres of this island, giving them an ideal manufacturing site. In the manufacture of steel castings Pittsburgh has taken a commanding position, and during 1899 some four or five new concerns were organized. The largest of these is the Pittsburgh Steel Foundry, whose plant is at Glassport, Pa., and has already been started up. There is also the Union Steel Casting Company, whose plant has been started; the Pittsburgh Malleable Company, who are building a large plant at McKees Rocks; the Columbia Steel Foundry Company, recently organized, and who will also build a large steel foundry, and one or two other concerns. Probably the greatest undertaking of all was the new works of the Pressed Steel Car Company, at McKees Rocks. The greater part of this new plant was built by the Riter-Conley Mfg. Company, and it sprung up as if by magic. This great concern started work on this plant early in the year, and it was finished and put in operation some two or three months ago, giving the Pressed Steel Car Company, at their works in Pittsburgh, and one at Joliet, a capacity for turning out over 100 steel cars per day. The growth of the steel car business in the United States has been without parallel in any other branch of industry. In 1896 the first steel car ever built was exhibited at the Master Car Builders' Convention in Saratoga. The first order placed for steel cars was by the Pittsburgh, Bessemer & Lake Erie Railroad, and they proved so satisfactory that the order has been duplicated several times, and other railroads all over the country and abroad have adopted these cars, and thousands are now in satisfactory use. It looks very much as though the day of the wooden car had gone, but they will probably be used more or less for some time to come.

The Outlook for 1900.

We close the year 1899 with the mills well filled with tonnage, practically the entire output of the Valleys being under contract for first half, the steel mills being sold up and generally favorable conditions all around. There ought to be a good deal more money made in the iron trade in 1900 than there was this year. The advantage the new year will have over the old is that most of the low priced contracts will have been cleaned up, and tonnage will be on a much higher basis. Of course the fact is not lost sight of that 1900 is a presidential year; but conditions are so favorable that it is not believed that it will cut much figure, unless serious complications should arise before the South African dispute is settled, involving the United States. It does seem that the year 1900 ought to be the best year, as regards tonnage and profits, that the iron trade has ever had.

Pig Iron.

Bessemer Pig.—What a wonderful year 1899 has been for the blast furnace man, both as regards the demand for his product and the prices he has obtained for it! The blast furnace that cannot show a balance on the right side of the ledger at the close of business this year nearly as large as the investment itself, or perhaps larger, has certainly something wrong with its management, or there is something out of order somewhere. To show the wonderful advances that have taken place in prices of pig iron it is only necessary to say that in the first week in January, 1899, Bessemer pig iron was selling at about $10 to $10.25, Valley furnace. The market was quiet, but fairly strong, and there were no indications in the first week of the year of the tremendous activity in demand and the terrific advance in prices that was to follow. On January 1, 1899, there were in blast in the United States 200 furnaces, the weekly capacity being 243,516 tons, against 188 furnaces on January 1, 1898, with a weekly capacity of 226,600 tons. The furnaces in blast on January 1, 1899, had an annual capacity of about 12,000,000 tons, while the furnaces in blast at the time this report is written have an annual capacity of about 15,000,000 tons, showing a net increase in actual output in 12 months at the rate of about 3,000,000 tons. The output of pig iron this year is larger than in any one year in the

history of the iron trade, but unless all signs fail the output in 1900 will be a record breaker, and will exceed 15,000,000 tons. It will be considerably increased by the output of new furnaces to be built by the American Steel and Wire Company, the Carnegie Steel Company, Limited, and Jones & Laughlins, Limited, all in the Pittsburgh district.

As stated above, the year 1899 opened with the price of Bessemer iron about $10 to $10.25 at Valley furnace, and the market was quiet. We entered the year with a very large tonnage of pig iron booked, and there was much strength to the tone of the market. There was quite an accumulation of pig iron at this time in some of the yards of the steel companies, owing to the shut down during the holidays, and for this reason a good deal of iron that had been bought some time before was not being taken out. About the middle of January the activity commenced with sales of about 25,000 tons of Bessemer pig iron in the Pittsburgh district at the full price of $10.50, Valley furnace After this sale this price was immediately withdrawn, and from $10.90 to $11, Pittsburgh, was asked. There was a feeling at this time that there was a good deal of danger of a pronounced scarcity of pig iron, and buyers were hastening to cover their requirements. The close of January found the market very strong, with tendency of prices decidedly upward. February opened with the condition unchanged, the market on Bessemer pig being strong at $10.50, Valley furnace, and $11, Pittsburgh. The output of the Valley furnaces was marketed at this time through an executive committee, and at a meeting of this committee held in Youngstown on February 6 it was decided to withdraw the price of $10.50, Valley, the ideas of the furnacemen at this time being $11 at furnace. The fact that some of the larger steel merchants were figuring on the purchase of round blocks of Bessemer iron gave the market a very strong tone. The blizzard which started about the middle of February held back business a good deal, but there was no recession either in demand or price of Bessemer iron. At this time, $11, Valley furnace, was being quoted for small lots, and at a meeting of the furnacemen held in Cleveland on Saturday, February 16, the price was advanced from $11 to $12 at furnace, the market being exceedingly strong. On Saturday, February 25, the Pig Iron Association sold 12,000 tons of Bessemer iron at $12.50, Valley furnace, which was the top price reached at this time. This iron was for delivery before July, as the furnaces refused to sell iron for third or fourth quarters. The market commenced to advance rapidly, and $13, Valley furnace, was quoted for iron for the second quarter. The furnaces in blast on March 1 had an estimated weekly output of 223,865 tons. Stock declined rapidly through February, showing a reduction of 47,000 tons. At this time preparations were being made for the starting up of furnaces all over the country, prices having reached that point where stacks long idle could get in and market their iron at a profit. The tone of the market was very strong; a somewhat feverish condition existed. About March 10 a Valley furnace sold 15,000 tons of Bessemer pig to a Pittsburgh plate interest at $13, Valley furnace, deliveries running through the second and third quarters. Prices were then withdrawn, and only a day or two after Bessemer pig sold at $15, Valley furnace, or $15.65, Pittsburgh. Furnaces at this time were quoting $15 for iron for the second half, while other makers refused to sell. Quite a large tonnage of iron was sold in the first half of March, but along about March 25 the National Steel Company, the Carnegie Steel Company, Limited, and other smaller consumers came in the market and bought 130,000 tons of pig iron at $14.50, Valley furnace, for delivery in second half. Naturally this had the effect of further advancing prices. When April opened furnaces were quoting $15 at furnace.

There were no particularly large sales in the early part of April, but the market was in very satisfactory condition, the furnaces having their output sold for some time ahead, and at very profitable prices. April closed with the market $14.50 to $15, with very little iron to be had at the lower price. In the first week in May the Bessemer Furnace Association held a meeting and fixed the price of iron for the third quarter at $15 at furnace and sold 10,000 tons for May, June and July at that price. This pretty well cleaned up all the surplus iron up to July, and the market was very strong and somewhat feverish. By May 15 prices had advanced to $16 at furnace, and a stock report issued at this time showed the lowest stocks of iron ever held by the furnaces, with all indications pointing to a very serious shortage in supply. It was known that large steel interests were not covered on pig for the second half, and that they were figuring on the purchase of very large blocks of iron, which, when consummated, would have the effect of sending prices much higher. At this time a leading interest bought 60,000 tons, another interest 50,000 tons, while smaller tonnages were sold to other consumers, and in all fully 200,000 tons of Bessemer iron were sold in the latter part of May for third and fourth quarter delivery. These heavy sales put the price of Bessemer pig at $16, Valley furnace, with most of the furnaces practically sold up for second and third quarter. On Wednesday, May 24, the Price Committee representing the furnaces met in Cleveland and advanced the price to $17 at furnace. At this time some iron was sold for the last quarter of 1899 at $17.50, furnace, and prices still going skyward. The market was very feverish, and almost every transaction was at a higher price than the preceding one. In the latter part of May the Republic Iron & Steel Company sold 35,000 tons of pig to the National Steel Company, taking billets in payment, and the Valley furnaces sold to the four leading steel interests about 150,000 tons of Bessemer pig, prices ranging from $14 up to $17. In the first week in June a leading interest bought 90,000 tons at $17, Valley, and the market was very strong at that figure. By the middle of June the price of Bessemer pig had reached $19 at furnace. and the market was still advancing. On June 21 the Bessemer Furnace Association met in Cleveland and sold a large block of iron for last half of the year at that price. The market remained without change for the balance of the month, but small lots of Bessemer were sold as high as $19.25 to $19 50 at furnace for prompt shipment. July opened with the market rather quiet, the Furnace Association declining to fix a price on iron, as there were no inquiries and the furnaces desired to hold the market down as much as possible. At this time some labor troubles cropped out at Sharpsville, and the six furnaces there were idle for nearly two weeks, taking about 1200 tons a day out of the market. This further complicated the situation and added to the scarcity of Bessemer pig, which was already being seriously felt. By the middle of July it had advanced to $20 at Valley furnace for the second half, and up to $21 was being paid for prompt iron. The monthly stock report issued early in July showed only 77,677 tons of coke iron on hand July 1, a decrease over June of nearly 25 000 tons. This indicated that in spite of the enormous production, which was being increased almost daily, consumption was more than taking care of it and pulling on stocks. The price of Bessemer pig remained at about $20, Valley furnace, during the close of July, but in the first week in August sales were made at $21 at furnace, and several of the large steel plants were seriously crippled by shortage of metal, and were compelled to close down a day or two at a time, waiting for pig to accumulate. In the second week in August a Valley furnace sold 30,000 tons of Bessemer pig for the first half of 1900 at $21.50 at furnace, and this added great strength to the market, indicating as it did that the high prices on pig were going to extend over into next year. On Saturday, August 19, the Bessemer Furnace Association met in Cleveland and went over the situation in the Bessemer pig iron market very carefully. Statements were shown giving the amount of pig that would probably be made by the furnaces for the last six months of 1899, together with sales, when it was found that practically the entire output of the Valley furnaces for the last half of 1899 was under contract. At this time Bessemer pig was $22 at the furnace and very difficult to get. In the last week in August 6000 tons of Bessemer pig were sold for delivery over the first half of 1900, 1000 tons of which was at $21.50 and the other 5000 tons at $22, Valley furnace. September opened with the Bessemer pig iron market strong, but without special feature. The market at this time was firm at $22 50, Valley, and in the second week in September there were sales of about 40,000 tons at that price. September closed with the market at $23 at furnace, sales having been made at that price, deliveries running as late as October, 1900. In the first two or three days of October the National Steel Company came in the market and bought 50,000 tons of Bessemer pig, a Valley interest 20,000 tons and a Pittsburgh interest 30,000 tons. Other smaller lots were sold, and altogether probably 125,000 tons of Bessemer were sold at about $23 at furnace. Most of this iron was for delivery in first half of 1900. The Bessemer Furnace Association met in Cleveland on Wednesday, October 18, and fixed the price of iron at $23 at furnace for the first half. The Federal Steel Company came into the market at this time and bought about 70,000 tons, 40,000 tons of which was at $23 at furnace and 30.000 at $22.50 at furnace. In the last week in October a large steel interest purchased 50,000 tons of Bessemer pig at $23, Valley furnace, for delivery in first half of 1900. Small lots of Bessemer pig for November and December delivery were selling at this time as high as $24 at furnace. The middle of November found the market exceedingly strong, with furnaces quoting from $23 50 to $23.75 for iron for first half. November was rather quiet, and it looked in the latter part of the month as though prices on pig iron might go off. However, in the last week of the month the announcement came that the price of old range ores had been fixed at $5.50, lower lake ports, for next year, an advance of $2.60 a ton over this year. This had the effect of strengthening the pig iron market, and in the first week in December there was a sale of 6000 tons, 1000 tons a month, January to June, at $24, Valley furnace. In the second week of

December a leading Pittsburgh interest bought 40,000 tons of Bessemer pig at $24, Valley furnace, for delivery next year. At this time it was estimated that practically the entire output of the Valley furnaces for the first half of 1900 was under contract. There had been an enormous increase in production of pig iron during the year, and on December 1, 1899, out of 317 coke and anthracite furnaces in the United States, 253 were in blast, the weekly capacity being about 290,000 tons, or about 15,000,000 tons a year. In spite of this enormous production consumption was steadily keeping up, and in fact stocks were being reduced right along. During the year the price of Bessemer pig advanced about $14 a ton, the year opening with the market $10 and closing at $24. It has been the most profitable year the furnacemen have ever had, and it is probably not an exaggeration to state that a number of furnace plants have more than earned their entire investment this year.

Gray Forge.—The market on gray forge also showed an enormous increase in production and unparalleled advances in price. The year 1899 opened with the price of gray forge below $10 at Valley furnace. In sympathy with Bessemer pig it commenced to advance shortly after the fist of the year, and by the middle of February was quoted at $10.50 to $10.75 at furnace. The price kept steadily advancing, and at the close of July gray forge was quoted at $11.50 to $11.75 at furnace. The price of gray forge advanced in March about $3 a ton, the market on March 29 being $14 at Valley furnace. The price remained about stationary during April, but in the first week in May it commenced to again advance, and by May 15 had reached $14.50 at furnace. From this time the market kept steadily advancing from month to month, and June closed with the price $17 at Valley furnace, or $17.75, Pittsburgh. There was a considerable scarcity of forge iron at this time, and a good deal of Southern iron was brought into the Valleys, and also into Pittsburgh, the rate from Southern furnaces to the Valleys being $4.20 and to Pittsburgh $4.60 a ton. July closed with the gray forge market somewhat easier, the supply having considerably increased by reason of several furnaces in the Valley having changed from foundry to forge. There was no particular change in the market on gray forge until the latter part of August, when a very large tonnage of Southern iron was sold in the Valley for delivery next year from $14 to $14.25, which, with the rate of $4.20, made the price $18.20 to $18.45, Valley mill. Round lots of Southern forge were also sold for Pittsburgh delivery at $18.60, the rate being $4.60 a ton, making the price $14 at Southern furnace. In first week in September there was a further advance, and gray forge sold at $19 at furnace, equal to $19.75, Pittsburgh. There was an active demand for mill iron at this time, and the market was very strong. By September 15 the market had further advanced, and forge iron had sold at $20, Valley, equal to $20.75, Pittsburgh. The month closed with the price of gray forge $20.75 to $21 at Valley furnace. There was no change in the market during October, the price remaining at $20.50 to $20.75 at Valley furnace. These prices were maintained through November and December, the market being practically stationary during those two months. About the middle of December there were several lots of gray forge sold at $21, delivered Valley mill, equal to $20.85 to $20.90 at furnace. In the year the price of gray forge steadily advanced from less than $10 in January up to about $21 at furnace, or $11 a ton.

Foundry Iron.—In foundry iron the advance during the year was even greater than in gray forge. Early in January the price of No. 2 foundry was about $10.50, Pittsburgh. The market steadily advanced during the year, and at the close of December $23, Pittsburgh, was being paid for standard brands of No. 2 foundry. A number of times during the year there was quite a famine in the supply of foundry, and fabulous prices were paid for prompt delivery. No. 2 foundry sold in small lots, and for prompt shipment, as high as $24.50, Pittsburgh.

Steel Billets.

The course of the billet market during 1899 was much the same as that of the pig iron market, except that the spread between Bessemer pig and billets as the year progressed grew larger and larger, and at one time was $15 or more. The events of the past year in the billet market have proved very conclusively that there is a shortage of converting capacity in the Pittsburgh district when the tonnage in finished material is large enough to keep the finishing mills fully employed. For three or four months during the year there was a famine in steel, and fabulous prices were paid for it. More than one consumer of steel was compelled to pay above $40 for billets, and was glad to get them at that price. The billet trade is in a vastly different condition from what it was a year or so ago, in the fact that the supply of steel is now controlled by four or five concerns, and it looks very much as though an era of high prices had set in and would continue for some time. Pittsburgh is not a large seller of steel billets; in fact very little steel is sold from this district in the open market. The largest makers are the Carnegie Steel Company, and they use the greater portion of their product. Jones & Laughlins, Limited, are large producers of Bessemer steel, but in the past year have built and started up some new finishing mills, which have taken them out of the market as sellers of billets. The Shoenberger Steel Company were taken over by the American Steel & Wire Company, and they use the entire product of the plant in the manufacture of rods, wire and wire nails. A new blooming mill is being added to this plant, which will bring the capacity up to 800 or 900 tons a day. The Oliver & Snyder Steel Company plant at Twenty sixth and Railroad streets, Pittsburgh, was also taken over by the American Steel & Wire Company and is no longer a factor in the open market. The National Tube Company have a Bessemer plant at McKeesport, but its entire product is used in the manufacture of skelp and other finished materials by that concern. The principal sellers of steel in the open market are the National Steel Company, but none of their mills are located in the Pittsburgh district.

There has not been during 1899 any material increase in Bessemer steel capacity in the Pittsburgh district, but the increase in basic open hearth capacity has been very large. The Carnegie Steel Company have finished a third open hearth plant at Homestead, and are now building 14 50-ton furnaces at Duquesne. Fabulous prices were paid for basic steel during the steel famine, as high as $55 a ton at mill being paid for high carbon open hearth axle blooms. A large increase in open hearth capacity in the Pittsburgh district during 1899 has come in the building of half a dozen or more steel casting plants, all of which are equipped with either acid open hearth, basic open hearth furnaces, or both. It does seem that the increase in consumption of steel in the coming year is to be met by basic open hearth, which is supplanting Bessemer steel very fast.

The year 1899 opened with Bessemer steel about $16 a ton, Pittsburgh. Deals were on for the purchase of a number of plants in the Wheeling and Valley districts and the trade was considerably at sea. The mills were pretty comfortably filled with business and the outlook was very bright. Two of the leading mills in the Pittsburgh district were practically out of the market in the middle of January, sellers having all the tonnage on their books they cared to enter. The last week in January saw a material advance in prices, mills quoting as high as $17.25, f.o.b. at mill. In the first week in February there was a sale of 10,000 tons of open hearth billets at about $17.50, maker's mill, deliveries running through nearly the entire year. This eventually proved to be an excellent purchase. By the middle of February the supply of steel was much smaller than the demand and prices were advancing very fast, one lot of 500 tons being sold for immediate shipment at $18.50, delivered in Pittsburgh district. The market was strong at about $18 at mill. It was at this time that the National Steel Company were organized, taking over the Bellaire Steel Company, Ætna-Standard Iron & Steel Company Bessemer plant at Mingo Junction, Ohio Steel Company, Shenango Valley Steel Company, King, Gilbert & Warner, and Buhl Steel Company. Small lots of steel for prompt delivery were now being sold at $20, delivered. On March 1 the market had advanced to $21.50, with some sellers quoting $22. About a week later $24 was paid for a small lot of steel for prompt shipment. By the middle of March the Pittsburgh mills were out of the market as sellers, and as high as $25 at mill was being quoted for steel for prompt shipment. The famine in supply of steel was now on in all its force, and prices advanced very fast. At the close of March billets were $25 to $25.50, maker's mill, with the supply very limited. The market advanced steadily in April, and at the close of that month $25.50 to $26, maker's mill, was quoted. May opened with the market very strong, but not much inquiry, buyers holding off, hoping that the market would recede. By May 10 there were some very heavy transactions in billets, the American Steel & Wire Company buying a large tonnage, and the American Steel Hoop Company bought enough to cover their entire requirements for the last half of the year. Fully 200,000 tons of steel was sold at this time, and the market immediately advanced to $27, maker's mill. The close of May found consumers of steel entirely at the mercy of the market, small lots for prompt shipment having been sold at very close to $30. By the middle of June small lots of rod billets, owing to their scarcity, had sold up to $31.50 at mill, while as high as $48 had been done in basic billets with carbons running 0.40 and higher. The first week in July found a still higher market for steel, $34, Pittsburgh, having been offered by buyers for prompt slabs. The operation of finishing mills at this time was being very seriously interfered with by the scarcity of steel, and plants were shut down at frequent intervals for two or three days at a time, to allow steel to accumulate. The last week in July found a heavy demand for slabs, with sales being made on the basis of $34, Pittsburgh, or higher. Basic open hearth billets and slabs

sold at this time at $42 to $45, Pittsburgh. The market was strong all through August, the expected decline in prices not having been realized. In the latter part of the month billets were selling at prices ranging from $36 to $39 at mill. Buyers who had to have steel were at the mercy of the seller, and had to pay whatever price the mills saw fit to ask. At this time there were sales of basic open hearth billets at $43.50, while a round lot of slabs running up to 0.50 carbon was sold at about $50 at mill. Pittsburgh mills were not selling any steel to speak of at this time, being filled up for months ahead. The first week in September there was a sale of 1200 tons of rod billets at $38, Pittsburgh, with slabs quoted at $39 to $40. Prices had now reached a point where there was no inducement for buyers to cover their requirements, and they were buying only as their immediate necessities demanded. The last week in September found the market $39 to $40, Pittsburgh, but not a great deal doing. In the first week of October the situation had quieted down somewhat, and mills quoted $38.50 to $39 at mill. This condition continued through October, there being no further advance in prices and sales being made mostly for small lots. About October 20 a leading consumer came in the market and bought 50,000 tons of billets from the National Steel Company at a price very much lower than was being quoted for small lots. A Wheeling mill also bought about 30,000 tons at a low price, deliveries on both of these transactions running through first half of 1900. On November 1 billets for prompt shipment were being quoted at $38 to $39, and for first quarter or first half about $35. It transpired at this time that the sale of 50,000 tons referred to above was below $33 at mill. By November 15 the market had receded somewhat and billets were being quoted at $36 for delivery in the next two or three months. Prices had reached such a high point that buyers were willing to take hold, and as the mills were catching up somewhat with orders there was more disposition to shade prices to get business. For this reason the last week in November found the price of billets $35 to $36 and not much doing. This condition prevailed right through December, the amount of steel sold during the last month of the year being very small and prices ranging from $35 to $36 at mill. Tonnage in finished material had fallen off very considerably and buyers were not willing to take hold. During the year 1899 the price of steel advanced from about $16 at mill up to $42 and $43, which was paid in some cases for steel for spot shipment. The year has undoubtedly been the most profitable the steel mills ever had, and the outlook for 1900 is highly encouraging. It is not expected, however, that prices will be maintained through the entire year of 1900 on the present basis, but it is a fact that some steel has been sold for first quarter at about $35 at mill.

Steel Rails.

The rail trade in 1899, in point of tonnage, was probably the best year the rail mills have ever had. The tonnage has been enormous, and some unparalleled records for production have been made by the leading mills, particularly at the Edgar Thomson plant of the Carnegie Steel Company. When the year opened the price of rails was somewhere about $17, Pittsburgh, and very large orders were entered by the mills at that price or lower, deliveries running through the entire year. All the large railroads bought heavily, believing that the low price of rails, together with the very satisfactory outlook for business, warranted heavier purchases than usual. The year had not gone along very far until the rail mills commenced to feel the impetus of trade that existed in other lines, and prices commenced to advance. By the middle of February pig iron and billets had gone up very much, and the rail mills were full of orders, and as a natural result prices were advanced and standard sections were held at about $22, Pittsburgh. The mills at this time were booked up to July or longer. In the latter part of March a further advance of $1 a ton was made, rails being held at $23 minimum, Pittsburgh mill. About April 1 a further advance of $2 a ton was made, the local mill quoting $25 at mill for light or heavy sections. Only small lots were being sold at this time, as the mills were filled up pretty well for the balance of the year. An unusual condition also prevailed at this time in the fact that the price of rails was about $3 a ton less than the price of billets. In the first week in June the local mill advanced prices again, quoting $26 at mill for standard sections. This price did not last long, however, as in the latter part of that month a further advance of $2 a ton was made, the local mill quoting $28 to $30, Pittsburgh, depending on the order. At this time the Carnegie Steel Company were practically sold up on their rail capacity for balance of the year. The market was rather quiet during the summer months, the mills working on old contracts, and quoting on small lots that were coming up from $30 to $32 at mill. This price continued until about the middle of September, when the local mill again advanced standard sections to $33 and $35, Pittsburgh, depending on the order. In the week beginning October 16 some very heavy contracts were entered by the rail mills for 1899 and 1900 delivery, the announcement having been made that all orders received prior to Saturday, October 21, would be at the price of $33 at mill and all orders booked after that date would be $35 at mill. This resulted in a very heavy tonnage being placed, the amount being given as about 1,800,000 tons. Included in this was 105,000 tons for the Pennsylvania Railroad. After October 21 and up to the close of the year tonnage in rails placed was mostly for small lots, at prices ranging from $35 to $37 at mill. It is certain that the output of the rail mills in 1899 will be considerably over 2,000,000 tons, while the average of prices has given the mills a very handsome profit. A great deal of tonnage will be carried over into next year, already two or three of the leading mills being reported as having sufficient orders on their books to take the greater part of their capacity for the first six months. There were no important additions to the rail capacity in 1899 aside from improvements made at the leading mills, which considerably increased output. Railroads who placed orders for their rails in the early part of the year, when prices were about $16 to $17 at mill, were able to lay these rails during the summer months and sell the rails they took up at a very much higher price than they were paying for new rails. The railroads have all made a great deal of money this year, and, while iron and steel products used by them are all very high in price, it is likely that the roads will be very heavy buyers of material for 1900 delivery. It is when a railroad is making money that it spends money for improvements, and this has been one of the most profitable years the roads have ever had.

Finished Material.

Beams and Channels.—The demand for shapes in 1899 has been much the heaviest of any one year in the history of the structural trade. During the middle of the year there was a famine in material for three or four months, fabulous prices being paid where sellers were able to promise anything like prompt delivery. The agreement among the six beam mills, consisting of Carnegie Steel Company, Limited; Jones & Laughlins, Limited; Phœnix Iron Company, Passaic Rolling Mill Company, Pencoyd Iron Works and Cambria Steel Company, which was formed in the first week in January, 1898, has been continued through last year and this year, and only the other day was renewed for 1900. It has proven to be by far the most satisfactory agreement ever made between the beam mills, and results have more than exceeded expectations. The tonnage in beams and channels in 1898 was estimated to be about 400,000 tons, but in 1899 considerably exceeded that amount and may reach 500,000 tons. The two local mills, Carnegie Steel Company and Jones & Laughlins, have run to utmost capacity through the entire year, and their output of structural shapes will be very much larger than in any year in the history of either concern. Both mills will carry a large tonnage over into next year, deliveries of which should have been made some time ago. As indicating the extremities to which buyers were put to obtain material for prompt shipment, we can state that 10 and 12 inch beams from stock have sold as high as 3 cents a pound. the regular price being 2.25 cents. On December 31, 1898, after telegraphic and telephone communication between the six mills composing the beam pool, it was decided to advance prices on beams and channels $2 a ton and on other shapes $1 a ton. This made the price of beams and channels up to 15-inch 1.30 cents; 18, 20 and 24 inch, 1.40 cents; angles, 1.15 cents; zees, 1.25 cents; tees, 1.30 cents, f.o.b. at mill. These prices went into effect on January 1 and continued in force until about January 15, when the Carnegie Steel Company, Limited, made an individual advance of $1 a ton on angles, zees and tees. In the last week in February, on less than 24 hours' notice, another advance of $2 a ton was made on account of the advance in raw material and the higher prices ruling for all other kinds of finished products. This made the price of beams and channels up to 15-inch 1.40 cents; 18, 20 and 24 inch, 1.50 cents; angles, 1.30 cents; zees, 1.40 cents; tees, 1.45 cents. About March 15 the Carnegie Steel Company, Limited, made another individual advance on all kinds of structural material, except beams and channels, of $1 a ton. This action, however, was not followed by the other mills. On March 30 another advance of $2 on all kinds of structural material was made, bringing the price of beams and channels up to 15-inch 1.50 cents; 18, 20 and 24 inch, 1.60 cents, with proportionate advances for other shapes. At this time the full force of the enormous demand was being felt and the mills were loaded to the guards with tonnage. On June 1 the beam pool held a meeting in New York and advanced material $5 a ton. This brought the price of beams and channels 15-inch and under up to 1.75 cents; 18, 20 and 24 inch, 1.85 cents; angles over 3-inch and up to 6 x 6, 1.75 cents; smaller sizes, 2.10 cents; bulb angles and deck beams, 2.05 cents; zees, 1.75 cents; grooved rolled plates, 2 cents; tees, 1.80 cents. all f.o.b. Pittsburgh. It was at this time that buyers were at their wits' ends to get delivery of material bought at lower prices, and were paying fancy premiums over established prices where

they could find a seller that had any material in stock and could ship right away. Some very large orders were being placed at this time for delivery in New York City, building operations there being exceedingly heavy. On Friday, July 7, another advance of $5 a ton on all kinds of structural material was made, making a total advance of $15 a ton since the first of the year. This made the price of beams and channels up to 15 inch 2 cents; 18, 20 and 24 inch, 2.10 cents, and other material in proportion. By July 15 both local mills had practically enough tonnage on their books to take their entire output for balance of the year. This busy condition continued until the last week in August, when another meeting of the beam mills was held in New York City, at which the six mills were all represented in person, and another advance of $5 a ton was made, bringing the price of beams and channels up to 15-inch 2.25 cents; 18, 20 and 24 inch, 2 35 cents; angles, 3 inch and up to 6 x 6, 2 25 cents; under 3 inch, 2.50 cents; tees, 3 inch and larger, 2 30 cents; under 3 inch, 2.50 cents; zees, 3 inch and larger, 2 25 cents; while grooved rolled plates were quoted at 2.60 to 2.75 cents. No further advances in prices on structural material were made during balance of the year, but the mills kept running to their utmost capacity and will carry over into 1900 a considerable tonnage from this year. On Tuesday, December 19, the six mills composing the beam pool met in Pittsburgh and renewed the beam agreement for 1900, W. C. Temple of Pittsburgh continuing to act as commissioner

Plates.—While advances in prices of all kinds of finished material in 1899 were very heavy it remained for plates to make the banner record in this respect. To substantiate this it is only necessary to state that in the first week in January tank plate, ¼-inch and heavier, was 1.25 cents, f.o.b. mill. In about six months from that time, or say along in June and July, it sold up to 3 cents a pound, an advance of $35 a ton. The tonnage in plates in 1899 has been enormous, and for four or five months in the middle of the year material could hardly be had at any price, and work was delayed all over the country on account of inability of contractors to get shipments from the mills. There has been a very heavy increase in plate capacity this year, due to the building of new mills by the Carnegie Steel Company and enlargements of other mills and the starting up of some Eastern plate mills that have done very little for the past four or five years. In spite of the enormous increase in tonnage the demand kept far ahead of the supply until about October, when the mills began to catch up with their orders and the situation became considerably easier. It is hardly necessary to follow the course of advances in prices of plates that were made during the year. As noted above, tank ¼-inch and heavier in the first week in January was 1.25 cents at mill; flange, 1.35 cents; marine, 1.45 cents; while ordinary fire box was 1.65 to 1.75 cents; locomotive fire box, 2.75 cents. In the second week in January the Carnegie Steel Company bought from the Bethlehem Iron Company a large plate mill, universal plate mill and slabbing mill, dismantled them at Bethlehem, removing them to West Homestead, where they have since been reconstructed and put in operation. During the early part of the year the famous agreement was made between the Carnegie Steel Company and the Pressed Steel Car Company, by which the former concern are to supply to the latter a large tonnage in plates for ten years, the price of which is on a sliding scale, based on the average price of Bessemer iron, f.o.b. Pittsburgh. As early as January 15 the announcement was made in our market reports that several of the leading plate mills had about all the tonnage on their books they cared to take and were practically out of the market as sellers. By February 1 it was not a question of price but where to get material. Local mills were turning down tonnage, being unable to make deliveries wanted. Prices commenced to advance rapidly, and in the first week in March tank was up to 1.60 cents, with proportionate advances for other kinds. From this time on advances in prices of plates were frequent, and at the close of June tank ¼-inch and heavier was 2.35 to 2.50 cents at mill. The advance did not stop here, but prices kept steadily going up, and in the first week in September sheared plates were 2.75 cents minimum, f.o.b. at mill. At this time Jones & Laughlins, Limited, started up the 96 and 72 inch plate mills at the Soho works, which they had bought some time before at a very advantageous price. By September 15 tank plate ¼-inch and heavier, for anything like prompt delivery, was readily bringing 3 cents a pound, the highest price reached for many years. Early in October it was evident that the mills were catching up on deliveries, and some of the small plate mills in the East that had been fixed up and put in operation were taking business. This caused prices to slowly recede, although there was no slump at any time. In the last week in December sheared plates ¼ inch and heavier and in widths up to 60 inches were offered as low as 2.25 cents at mill, while wide sizes were held at about 2.50 cents at mill. The Carnegie Steel Company, the Carbon Steel Company and smaller plate mills will carry over into 1900 a very large tonnage. The indications are that 1900 will be a repetition of this year as far as demand is concerned, but owing to the enormous increase in plate capacity the average of prices may not be quite as high. By far the largest individual consumer of plates is the Pressed Steel Car Company, who are using from 1000 to 1200 tons per day in the manufacture of steel cars. The greater part of this tonnage is furnished by the Carnegie Steel Company on a ten-year agreement.

Iron and Steel Bars.—Probably the principal event in the bar trade during 1899 was the organization of the Republic Iron & Steel Company, which concern took over about 34 of the leading bar mills in the West and South, and are practically in control of the bar trade west of the Alleghany Mountains. The American Steel Hoop Company, who were also organized early in the year and took over the hoop and cotton tie mills, are also large producers of iron and steel bars. These two concerns practically control the trade in the West. The tonnage in iron and steel bars in 1899 has been enormous, and the average of prices has been high and very profitable. In the first week in January iron and steel bars were quoted at about 1 cent at Pittsburgh and Valley mills. The market was strong, and with the advancing tendency in steel buyers were placing orders very freely in anticipation of higher prices. This low price did not continue long, for in the first week in February steel bars were quoted at 1.10 cents at mill, and iron bars at 1.05 to 1.10 cents at mill. At this time the move to consolidate the bar mills was under way and the trade were trying to get under cover, anticipating that prices would be advanced. By February 20 steel bars were 1.25 cents minimum and iron bars 1 15 cents, with prices strong and every indication of going higher. By March 15 iron and steel bars were 1.35 cents at mill, and from this time on prices advanced steadily, reaching high water mark in the last week in September, when iron bars were quoted at 2.25 cents at mill for delivery in December and January and higher prices being paid for prompt shipment. Local mills were quoting high grade iron bars at 2.50 cents, while on steel bars from 2.50 to 2.75 cents was being quoted. This was the top of the market, as early in October the pressure on the mills became relieved to some extent and prices also grew easier. The decline was gradual however, and at the close of December iron bars were fairly strong at 2.15 cents at mill and steel bars 2.25 cents, with some sellers quoting higher. The Republic Iron & Steel Company are making some very extensive improvements at some of their plants, which will add considerably to their capacity. Jones & Laughlins, Limited, who are the largest local producers of steel bars, have also added considerably to their capacity by putting in new equipment. Considerable tonnage has been booked by the mills for delivery next year, and the outlook for 1900, both as regards prices and demand, is very satisfactory. It is anticipated that tonnage will be fully as large in 1900 as this year, and with the mills practically cleaned up on low priced contracts there should also be a very hand some profit for well equipped mills.

Sheets.—Taken as a whole the black and galvanized sheet trade in 1899 was very satisfactory. It is true that business in the last quarter of the year was not as good as in second or third quarter, but when the whole year has been balanced up it will be found to have been the best year that the sheet trade has had for a very long time. The failure to combine the sheet mills has been responsible for the demoralization which has existed in the sheet trade for the past couple of months. It will be recalled that very early in the year, or immediately after the organization of the American Tin Plate Company and then the National Steel Company, it was deemed feasible to combine the sheet mills. The movement was put under way along in March and after working on the deal for three or four months it was finally postponed until fall, owing to the fact that Judge W. H. Moore desired to take a long vacation. The options given by the mills were renewed until November 1, but were allowed to expire without being exercised. Most of the mills, in anticipation that the negotiations would succeed, held off from selling for delivery after November 1, and as a result when the scheme to combine the mills was abandoned there was a scramble to sell sheets, with the inevitable result that prices were forced downward very fast. However, it is the belief that the sheet trade will show material improvement both in demand and prices after the first of the year. Some of the mills still have comparative cheap sheet bars and are naming low prices, which, based on bars at $36, would represent a loss. The year opened with No. 27 sheets about 1.85 cents and galvanized 80 and 10 per cent. off. The mills were fairly busy and the outlook was reassuring. In the latter part of January prices advanced to the basis of 1.95 cents for No. 27 and 80 and 7½ per cent. for galvanized. In the first week in February the market was strong, the move being started to consolidate the mills. Prices continued to move upward and in the latter part of February No. 27 sheets were 2 cents minimum and galvanized 75 and 10

per cent. At this time sheet bars were above $20 a ton and spelter about 6 50 cents a pound. The market continued to advance right through March, and in the first week in April No. 27 were quoted at 2.50 cents and galvanized at 75 per cent. off. There was no change in price in April and about May 1 Isaac W. Frank, representing the Moore interests, took up the matter of getting options on the mills This added further strength to the market, and by the middle of May No. 27 were selling at 2 75 cents and galvanized 75 to 70 and 10 per cent. off. In June and July sheets for prompt shipment were very scarce and up to 3 cents a pound was paid for No. 27, while galvanized had advanced to 70 and 10 to 70 and 5 per cent. In the first week in September prices were still higher, No. 27 being quoted at 3.15 to 3.25 cents and galvanized 70 and 5 per cent. Early in October, when it was seen that the combination could not be effected and the demand had also fallen off, prices commenced to decline and in the last week of that month No 27 had reached 3 cents, while galvanized was about 70 and 10 and 5 per cent off. In November prices declined further, reaching about 2 90 cents for No. 27 in the last week of that month, and 75 to 75 and 5 per cent. off for galvanized. In December prices declined slightly, and No 27 was sold at about 2.80 cents and galvanized 75 and 10 per cent. off. In exceptional cases these prices have been shaded by a few mills, while on the other hand some of the mills absolutely refused to meet the market. The price of sheet bars has been held by the leading producer at $36 at mill, and this being the case it is confidently expected that after the first of the year the tone of the sheet market will improve considerably.

Tubular Goods.—Aside from the very rapid advance in prices of tubular goods of all kinds the principal event of the year was the organizing of the National Tube Company, taking over 13 or 14 of the leading pipe and tube mills. The principal independent concerns at the present time are Spang, Chalfant & Co., A. M. Byers & Co., both of Pittsburgh, and Reading Iron Company, Reading, Pa. The organization of the National Tube Company was one of the largest effected in the iron trade and is a very strong combination. The concern have their own ore and coke properties, blast furnaces and steel works and are equipped to make tubular goods at very low cost. In the first week in January the price of merchant pipe was as follows: Butt black, 55 per cent.; lap black, 65 per cent.; butt galvanized, 45 per cent., and lap galvanized, 50 per cent., with an additional discount of five 10's, 7½ and 5 per cent. in carload lots, and five 10's, 7½ per cent. in smaller lots. These low prices, however, did not continue long, for at a meeting of the Price Committee of the wrought iron tube mills, held in Pittsburgh about February 10, an advance of 5 per cent. was made. At this time the Indiana Gas Company came into the market and placed an order for 150 miles of 10 inch pipe, dividing it between National Tube Works Company and American Tube & Iron Company. From this time on prices advanced sharply and about July 1 the organization of the National Tube Company, which had been under way for three or four months, was effected. That concern have been conservative in the matter of advancing prices, and when advances were made they were based on a rising market on raw material. At the close of the year the pipe and tube market, while quieter in demand than in the summer months, was strong in price and the mills comfortably filled with tonnage. The year has been a very profitable one for the pipe mills and the outlook for 1900 is regarded as very reassuring. Spang, Chalfant & Co., one of the independent mills, have made considerable improvements and additions to equipment at their plant, which will very largely increase their capacity. A new concern who have started up in the last month of the year are Monongahela Tube Company, whose plant is at Wilson Station on the line of the P. V. & C. Railroad, a few miles from Pittsburgh. This concern are equipped to make pipe up to 4 inches, and we are advised that they have placed contracts for large additions to their plant.

Skelp.—The mills rolling iron and steel skelp have had a very satisfactory year, both as regards tonnage and prices. At the opening of the year grooved steel skelp was 1 cent a pound, grooved iron about 1.10 cents and sheared iron about 1.25 cents. The mills were pretty well filled up with business and very firm in their ideas as to prices. It was not long, however, until the market commenced to move up and early in February some sharp advances in prices took place. In July and August, when demand was at its hight, skelp could hardly be had at any price and grooved steel and iron had advanced to 2.15 and 2.25 cents, while sheared iron and steel were quoted as high as 2 50 cents, Pittsburgh. High water mark in prices of skelp, however, was reached in August, when grooved steel and iron for prompt shipment sold as high as 2.50 cents in small lots and sheared at 2.75 cents. These, however, were exceptional prices. Late in October, in sympathy with other lines of finished product, prices of skelp commenced to decline and at the close of December grooved steel and iron were weak at 1.95 to 2 cents and sales have been made at lower prices. Sheared iron and steel were about 2.35 cents with very little doing. During the year some mills were started up in the East rolling skelp and a good deal of their product was sold in the Pittsburgh district.

Merchant Steel.—To the mills rolling the various grades of merchant steel the year 1899 has been a very satisfactory one, tonnage being the largest in the history of the trade and the average of prices very much the highest. Prices commenced to advance early in February and went up steadily until along in August and September, when top was reached. In the last couple of months in the year there was a slight decline on some lines, some of the mills having caught up pretty well with their orders and willing to make slight concessions in prices to secure tonnage.

Connellsville Coke.—The coke business in 1899 has been the heaviest of any one year in the history of the trade, and prices obtained, while perhaps not as high as were warranted by the heavy advances in pig iron and steel, have given the coke operators very satisfactory profits. The year opened with about 15,000 ovens in the Connellsville region active and 3500 idle, the price of standard furnace coke being about $1 60 a ton and foundry coke $1.75 to $1.90 to consumers. In the first week in the year the H. C. Frick Coke Company owned 10,640 ovens, all in the Connellsville region, and controlled by purchase or otherwise the entire output of about 2000 more ovens. This concern shipped in 1898 314,285 cars of coke, but their shipments in 1899 will very much exceed that figure. The year had not progressed very far until prices of coke commenced to advance, and by March 15 furnace coke was being quoted at $1.75 and foundry coke at $2.15. When May 1 was reached shipments in the region were the heaviest ever known, additional ovens being blown in almost every day. The prosperous condition existing in the coke trade at this time was shown by the voluntary action of the H. C. Frick Coke Company in advancing wages of all their employees 10 per cent. This was followed by the other smaller operators. At this time surplus furnace coke was bringing $2 a ton and foundry from $2.25 to $2.50. Production was gaining every week and on June 1 furnace coke was quoted at about $2.15 and foundry coke at $2.30 to $2.50. In July as high as $2.40 and $2.50 was paid for prompt furnace coke, and it was very difficult to get even at that price. In this month the Frick Coke Company shipped 33,075 cars of coke, but this record was beaten in August, when the concern shipped 34,614 cars of furnace, foundry and crushed coke. By September 15 furnace coke was sold at $2.50 and foundry coke at $2.75. At the close of that month small lots of furnace coke had sold at $2.75 or higher and foundry coke at $3 to $3 25. In October there was a car shortage in the region and shipments were hampered very much. Many furnaces were compelled to bank for days at a time waiting for coke to accumulate. In October the Frick Coke Company shipped 35,266 cars of coke. In this month and early in November contracts for furnace coke for next year were made at prices ranging from $2.60 to $2.75, while in some cases, we are advised, as high as $3 a ton was paid for furnace coke for next year. Foundry coke has been sold under contract for first half as high as $3 and $3.25 a ton. In November the Frick Coke Company shipped 35,251 cars of coke. While it is too early as yet to give the total output of coke in the Connellsville region for 1899 it is estimated that it will reach 9,000,000 tons, exceeding the tonnage of 1898 by nearly 2,000,000 tons.

The National Founders' Association. — We understand that a call has been issued for the annual meeting of the National Founders' Association at Detroit, Mich., on February 1, the headquarters to be at the Hotel Cadillac. This is the organization in the general foundry industry which is modeled largely after the Stove Defense Association, successful for so many years. The same general plan is now being developed also by the Metal Trades' Association among machinery manufacturers. The present officers of the National Founders' Association are: O. P. Letchworth of Pratt & Letchworth, Buffalo, president; H. M. Leland of Leland & Faulconer Mfg. Company of Detroit, Mich., vice-president; W. H. Wells of Holly Mfg. Company, Lockport, N. Y., treasurer, and John A. Penton of Detroit, Mich., secretary. The administrative counsel includes, as honorary member, W. H. Pfahler of Philadelphia, and as members, W. O. Barbour of Barbour-Stockwell Company, Boston, Mass.; Jas. Barclay of Deeve & Mansur Company, Moline, Ill.; C. H. Booth of the Lloyd Booth Company, Youngstown, Ohio; A. J. Caldwell of Henry R. Worthington, Brooklyn; G. E. Emmons of the General Electric Company, Schenectady, N. Y.; I. W. Frank of Frank-Kneeland Machine Company, Pittsburgh, Pa.; H. W. Hoyt of the Gates Iron Works, Chicago, Ill.; C. L. Newcomb of the Deane Steam Pump Company, Holyoke, Mass., and Jos. A. Stone of the Riverside Foundry Company, Cleveland, Ohio. It is understood that important matters will come before the body at the forthcoming meeting.

The Edison Three-High Rolls.

In the description of the Edison concentrating works, which appeared in *The Iron Age* of October 28, 1897, mention was made of the three-high crushing rolls used in the concentrating building proper. Each roll was 36 inches in diameter by 30-inch face. The center one was fixed, or, in other words, was mounted in bearings rigidly secured to the housing. The upper and lower rolls were free to move in guides formed in the housing. The lower roll was driven through a wabbler from the main shaft. Each end of the upper and lower roll was provided with a sleeve which formed the bearing for the roll itself. This sleeve was made with grooves for the reception of a wire rope, which was wound about the sheaves thus provided. The ends were led upward and united over a single groove sheave so arranged as to be operated by the piston of an air cylinder. The system consisted of an endless rope passing several times around the ends of the upper and lower rolls, and the strain upon which could be regulated as desired by increasing or diminishing the air pressure. Therefore the pressure exerted by these two rolls against the center one could be regulated to a nicety. A further and important advantage possessed by this design is its elasticity, the freedom of movement obviates all danger of wrecking the machine.

From letters patent, just issued to Thomas A. Edison for this design, we are enabled to present a few of the details of construction. The general arrangement will be understood from the front elevation, Fig. 1. The pressure in the air cylinder is multiplied at the rolls on the principle of the compound block and tackle. If, for instance, there are ten turns of rope over the sheaves and a pressure of 6000 pounds upon the piston, there will be a pressure of 120,000 pounds forcing the rolls together. This force can be regulated at will by changing the cylinder pressure. An elastic fluid under pressure, such as air or steam, is used to give the pressure instead of weights, for the reason that variations in the thickness of the material passing through the rolls occur in very small fractions of a second, and the inertia of weights would be so great that no rope could be made to stand the excessive strains. With an elastic fluid pressure, however, and a light piston rod and movable sheave, these rapid changes are taken care of without danger of breaking the rope.

We find that these rolls are recommended for the rolling of iron as possessing features not found in the ordinary rolls. Their elasticity and freedom from excessive frictional losses, together with their quick and accurate regulation are the main points. In rolling iron it is desirable to change the pressures as the ingots lose their heat, and the elastic fluid cylinder, with valve and gauge, gives the means for instantly and accurately doing this. In using these rolls upon iron the upward movement of the bearing blocks of the top roll would be limited by suitable stops so as to permit the work to be sized; but the pressure upon the ropes should be so gauged that the pressure upon the limiting stops would not be more than a fraction of the total pressure, since all pressure exerted upon the bearings wastes power.

The sheaves are held to the rolls by collars, Fig. 2, and are bushed with phosphor bronze rings. To lubricate the bearing of the sheaves, a hole is bored centrally into the shaft from its outer end, and from this central hole radial holes pass outwardly to the surface of the shaft, as shown in dotted lines in Fig. 2. At one end of each of the roll shafts is provided a centralizing bearing similar in principle to the thrust bearings used on the propeller shafts of steamships, but especially constructed to adapt it for use on rolls, and when so used to act as the centralizing bearing, which resists the thrust in both directions and prevents the rolls from rubbing against the housings or bearing blocks. The shaft of each roll at the point where the thrust bearing is applied has two grooves. In these grooves are placed steel rings, forming ribs on the shaft, each ring being divided into two parts, so that it can be placed upon the shaft. These rings are surrounded by a split collar, which is secured together by bolts and has a flange which is bolted to the bearing block. The collar is provided with grooves embracing the rings or ribs, and which grooves are suitably babbitted. The divided collar incloses the bearing and enables it to be lubricated.

Another novel feature is employed in the construction of the rolls themselves, and is shown particularly in Figs. 2 and 8. Upon the shaft is mounted and per-

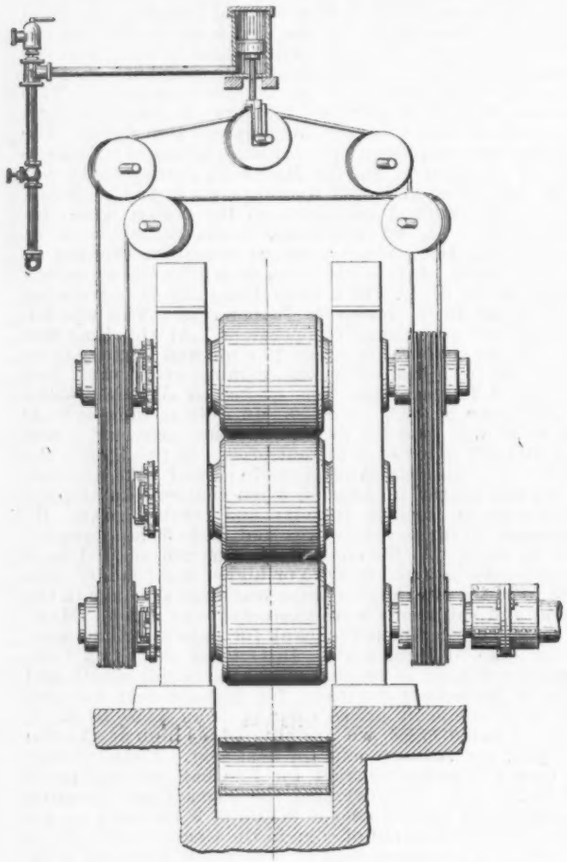


Fig. 1.—Front Elevation.

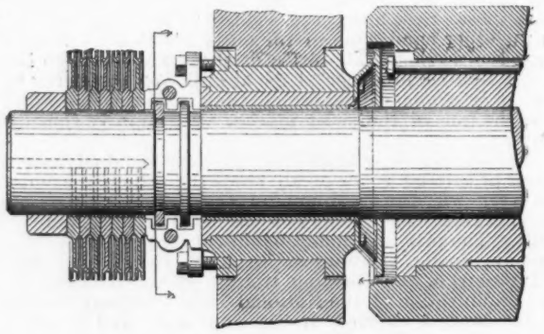


Fig. 2.—Sectional Plan through Part of Top or Bottom Roll.

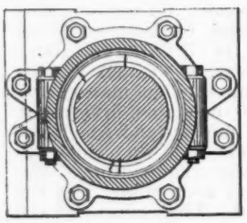


Fig. 3.—Section Indicated by Arrows in Fig. 2.

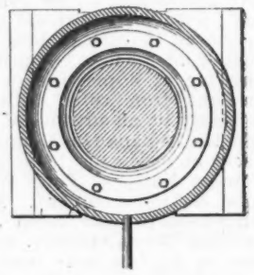


Fig. 4.—Section Looking in Direction of the Arrows in Fig. 2.

THE EDISON THREE-HIGH ROLLS.

manently keyed a cast iron cylinder, and over this is placed the crushing shell, which forms the wearing surface of the roll. This shell is prevented from rotating on the cast iron cylinder by a removable key, and the shell is held against longitudinal displacement on the cylinder by bolts, which extend through channels in the surface of the cylinder and engage by their heads and nuts the adjacent edges of the cylinder and shell.

The wabbling coupling, Fig. 5, consists of two cylinders, which are secured together by brass bolts, passing through flanges on the adjacent ends of the two cylinders. These bolts are made of such a size that when the rolls become clogged by some obstacle the brass bolts will be sheared off and the two parts of the coupling separated before damage is done to the machine. Each cylindrical section of the wabbling coupling is made in three parts, Fig. 6, and at the outer end of each of these three parts there is provided an internally projecting rounded lug. The adjoining ends of the shafts are provided with corresponding rounded grooves, in which the lugs play. The parts fit loosely together, and the motion is transmitted through the coupling without binding, even if the alignment of the shafts is not exact. By having the wabbling coupling made in six parts it can be readily taken apart and removed from the adjoining ends of the shafts without disturbing the position of the shafts.

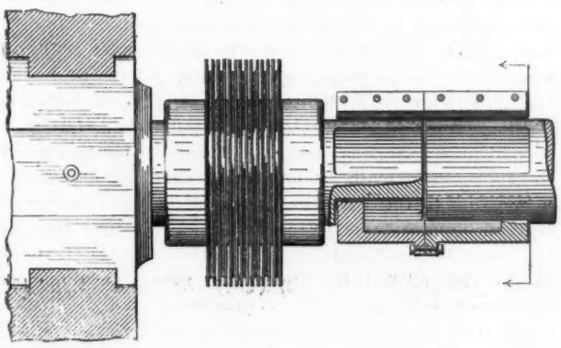


Fig. 5.—Sectional Plan Above the Block at the Driven End of the Lower Roll.

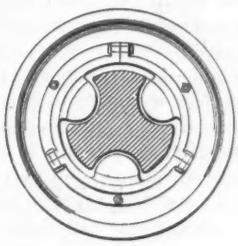


Fig. 6.—Section Indicated by Arrows in Fig. 5.

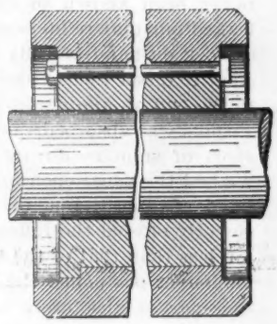


Fig. 7.—Section through One of the Rolls.

THE EDISON THREE-HIGH ROLLS.

Car Building in 1899.— Returns to the *Railroad Gazette* from all the contracting car builders in the United States excepting five with a very small output show that during the year just closing 123,893 cars of all kinds were built. This does not include cars built by railroad companies, the number of which this year undoubtedly exceeded any previous year, nor small cars such as cane cars for plantation work. According to the records, these figures represent the largest output for any year. Last year the total output was 105,158 cars, which was the best year since 1890, when 103,000 cars were built. Of the 123,893 cars built this year, 117,982 were for freight and 1201 for passenger service and 4710 for street railroads; 1904 freight, 104 passenger and 296 street cars were for export. Of the freight cars, 10,500 were of steel. Aside from this year being a record year as to the number of cars built, it is also a record year in the carrying capacity of the individual cars. It would be quite impossible to make any estimate of the increase in the capacity of the average car, or of the increase in the total capacity of the freight cars actually in service, but it is a well-known fact that the increase has been substantial. Another very remarkable incident of the year's car building was the great increase in the number of steel cars turned out. Last year these were 2700 and in 1899 they amounted to 10,500.

A suit has been begun in the United States District Court at New Haven, Conn., by the American Ordnance Company of Bridgeport, Conn., against the Driggs-Seabury Company of Derby, Conn., for alleged infringement of patent on a device for simplifying the construction of rapid fire guns. The contention is over a patent granted to Robert B. Dashiell of the United States Navy and assigned by him to the American Ordnance Company. The suit is an important one, as some of the best designs for breech loading guns are involved.

The Lead Market in 1899.

BY E. A. CASWELL, NEW YORK.

The review of the lead market for 1899 presents the most fundamental and radical change of any, throughout its history, since its inception. It came very near to being even more radical. Consolidation has been the order of the day, and at one time it looked as if the entire manufacture of shot, sheet and pipe would be brought under one roof, and the entire white lead interests under another; but those negotiations fell through, and what actually occurred was the consolidation of practically all the refining companies of the country, between the Atlantic and Pacific Coasts, except one. This exception was the concern of the Guggenheims, whose smelter is at Pueblo, and whose refinery is at Perth Amboy. The Balbach at Newark and the Westrn coast men are also out, but practically cut no figure in the matter of domestic production, whether out or in the combination, as they work almost exclusively on import ore. The result of the combination, in one word, is that it controls the market for ores, and to a very large extent that of pig lead. Their product will run close to 175,000 tons per annum, and as the Guggenheims work along in harmony with them, there is practically no competition except the soft Missouri leads, and the schedule of prices and of freight allowances thus far adopted by the American S. & R. Company have practically confined the sale of the Missouri leads to a very small territory, of which St. Louis is the center.

The usual history of power is to pass by easy transitions from use to abuse, but thus far the mammoth concern have shown every disposition to make an equitable adjustment of the interests of all, to become the balance wheel of the trade, and bring about steadiness in values. Wherever the higher power bears a trifle on one interest or another, although in a way which is for the general good, one hears the inevitable grumble and protest, but resistance is useless, and so they usually go on doing precisely what ought to be done, but what probably would not be, were it not for the *force majeure*.

The only appearance of competition has existed in the greater development of the Missouri mines, but it has been in no wise organized, nor more than would have probably existed any way as a natural development. The National Lead Company have been exploring a wide tract of land, but have not thus far produced much lead, although there is good promise of it. The Desloge and Central companies have been expanding somewhat, and the St. Joe, Doe Run and Anchor have amply kept up their previous record, and some smaller companies have been organized, but the total has not

been increased more than 5000 tons over that of last year.

General conditions and the prevailing exceptionally high prices have been highly favorable to a large production, and the totals of the year would doubtless have been many per cent. in excess of all records had it not been for deterrent events in Colorado and Idaho. In the former State a strike of the miners shut down all the furnaces, and most of the mines, from June 15 to the middle of August, and thereby cut off fully 12,000 tons from this year's total. Prior to that the sensational blowing up of the Bunker Hill and Sullivan Mill in the Cœur d'Alene district about May 1, and subsequent violent demonstrations, and the presence of a military force, have kept that district in abeyance more or less ever since, and rather more than less, so that the product from Idaho has been diminished probably 25 per cent.

Under these circumstances, and with apparent shortage in the supply of nearly 30,000 tons, we naturally ask why the price of lead did not run up in this active year to a point where we could take lead out of the bonded ore product, which was not drawn upon to any appreciable extent, nor, in fact, for other than re-export use. The fact that there was a combination, and in consequence a general exchange of confidences, revealed what may possibly have existed before, but which certainly had never been known to exist, since later in the year it leaked out that refiners and dealers went into 1899 with a stock on hand of fully 40,000 tons. This proved sufficient to offset the scarcity of the production from May 1 to the end of August, but with the result that the entire surplus was absorbed, thus leaving the country extremely short of supplies during September and October. Had we had the usual open market prices would undoubtedly have advanced, but the American S. & R. Company cleverly offered the following month's delivery at $1 per ton less than that of the then current month, and by this maneuver postponed the brunt of the demand, and held the market absolutely steady during the fall months. Had it not been for this bit of strategy, individual interests and a desire to secure the top notch would certainly have carried prices flush up to importation rates, resulted in a flood of importation, and we should to-day probably be suffering again from a large surplus, having a decline in rates, and a slow, dragging market for several months to come. That the average price in 1899 was very high is shown by the following table:

The average monthly price of common pig lead at New York

	January.	February.	March.	April	May.	June	July.	August.	September	October.	November.	December	Year's Average.	Highest Any Day.	Lowest Any Day.
1899.	3.95	4.23	4.17	4.11	4.28	4.25	4.34	4 35	4.39	4.40	4.40	4.43	4.27	4.45	3.75
1898.	3.53	3.54	3.54	3.50	3.51	3.67	3.80	3.86	3 86	3.67	3.50	3.54	3.63	3.90	3.45
1897	2.85	3 00	3.19	3.23	3.12	3.19	3.42	3.63	3.97	3.89	3.58	3.52	3.38	4.00	2.80
1896.	2.93	3.00	3 01	2.98	2.97	2.95	2.88	2.63	2.58	2.60	2.72	2.77	2.83	3.12	2.50
1895.	3.01	3.02	3.02	2.97	3.02	3.12	3.20	3.36	3 21	3.15	3.15	3.15	3.12	3.37	2.95
1894.	3.12	3.18	3 28	3.21	3.19	3.10	3.10	3.17	3.07	3.02	3.00	3.00	3.12	3.48	3.00
1893.	3.80	3.89	3.91	4.02	3.82	3.61	3.40	3.27	3.72	3.40	3.29	3.21	3.61	4.12	3 10
1892.	4.17	4.11	4.16	4.22	4.21	4.12	4.10	4.02	4.07	3.90	3.78	3.74	4.05	4.25	3.70
1891.	4.34	4.28	4.32	4.21	4.25	4.41	4.39	4.44	4.50	4.34	4.17	4.25	4.32	4.55	4.05
1890.	3.82	3.80	3.91	3.87	4.13	4.37	4.43	4.51	4.86	5.21	4.90	4.19	4.33	5.25	3.75

These figures show that the average year's price has not been so high since 1890 and 1891, and the invariable rule has been that any price above 4 cents for a long period of time unfailingly brings out free supplies and creates a surplus of lead; a low price period follows, and we then run into a period of shortage. In other words, it is the eternal swing of the pendulum, which has supply at one end and demand at the other. It has been in this country almost as regular as clockwork, and, according to all precedent, since the years 1895 and 1896 show an extremely low point in supply and price, observation leads us to believe that 1898 and 1899 are in the high range, both of price and production, and probably make the culmination of this wave in both respects.

Consumption this year has outstripped all previous record. The demand for white lead has been excellent. The use of raw material for shot, sheet and pipe has been large, and the demand for electrical work far and away greater than ever before. One concern, alone, in this line is using up 5000 tons per annum.

Another growing industry is the exportation of manufactured goods, and this, perhaps, has been the most salient feature of the year. Within a week an American company have literally "bearded the lion in his den," and secured at £151,000 the contract for furnishing the electric feeders for a Glasgow tramway against the next lowest British tender, at £161,000. This supply will, however, be drawn from bonded lead, not from domestic.

The outlook for the near future is not easy to forecast, but there are certain factors which seem reasonably sure. What interests trade most is the probable course of action to be pursued by the American S. & R. Company. It is evident that they cannot in any wise thwart the natural drift of prices. If supply exceeds demand they must inevitably lower the price and *vice versa*. At the same time it is probable that they will grade the fluctuations, generally avoiding, as far as necessary, all radical and rapid changes, and eliminating absolutely the element of speculation, which has been the chief cause of the most disastrous tumbles which the lead market has experienced. Two influences will come into play to bring about these results. In the first place, the American S. & R. Company decline to sell large blocks, either to dealers or to speculators; and in the second place, there is now little incentive for speculators to take hold of lead. It has heavy carrying expenses in proportion to the value of the metal, always preventing it from being a favorite football, and now they will play the game with all odds of information against them, and at the risk of putting themselves into a perilous position, provided they ever accumulated enough stock to make them in any wise a menace to the market. It may therefore be fairly assumed that prices in 1900 will be subject to few changes, and that those will be moderate and not over close together.

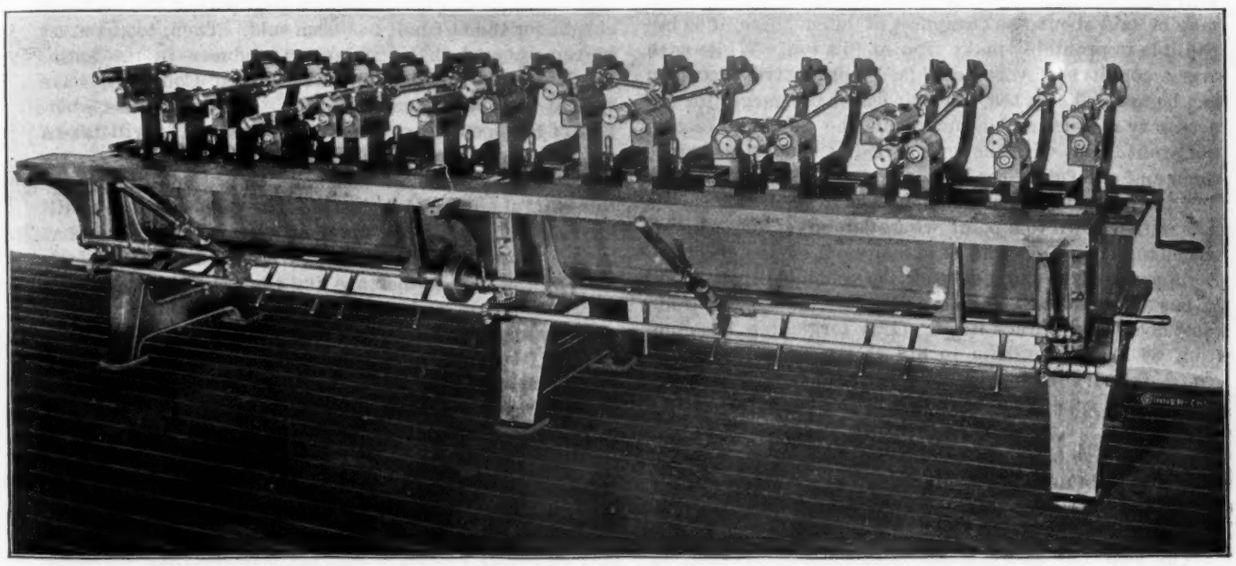
It is generally assumed that a Presidential election more or less disturbs the trade. This event, together with the fact that after two years of such extremely active business a slight reaction is easily possible, leads us to the conclusion that next year will show a steady, fair and good business without the boom qualities of 1899.

The Interstate Commerce Commission has just issued its yearly statement upon freight cars equipped with safety appliances. Some of the roads have not reported the changes made since June 1. An inspection of the report, as it stands, however, shows that the 262 lines and systems report owning 1,474,680 freight cars. Of this number 32 lines have all their cars equipped with automatic couplers, and 9 have air brake equipment on all cars. There are 51 roads having over 90 and less than 100 per cent. equipped with couplers, while there are 20 lines having air brakes on over 90 and less than 100 per cent. of their cars. The cars on 102 roads have less than 75 per cent. equipped with couplers, and 178 roads have less than 75 per cent. of the equipment fitted with air brakes. There are 34 small roads entirely without air equipment on freight cars, and 16 roads on which there are no automatic couplers. While there are a few roads that do not seem to have made much effort to comply with the law, it is evident that the great majority of lines have made a sincere effort to comply with its provisions, notwithstanding that in so doing the cars were ill spared from service during the past year.

At its last meeting, held in Bochum, the Westphalian Coke Syndicate fixed the selling prices for new contracts during 1900 and 1901 as follows: Blast furnace coke, 17 marks per ton for the two years; foundry coke, 18 marks 50 pf. in 1900 and 21 marks 50 pf. in 1901, small coke being 19 marks and 22 marks during the two years respectively, while the prices of inferior qualities are increased proportionately. Figuring the mark at 25 cents, this makes furnace coke $4.25.

Multiple Boring Machine.

The Hoefer Mfg. Company of Freeport, Ill., have brought out a multiple boring machine which embodies numerous novel features. The general construction is similar to that of a lathe bed. It is supplied with three legs, making it rigid. The top of the bed has planed V's the entire length upon which the spindle carriages are moved from one end of the machine to the other, or to any desired point, and are clamped firmly to the bed with clamps underneath it. The clamps are supplied with a hand wheel extending below the machine in convenient reach of the operator. The distance between the outside spindles is 12 feet. A screw is located in the center of the bed, running the entire length. This screw runs through the carriages, which are supplied with a one-half threaded nut, so that when the clamps are loosened and the nut is engaged into the screw the heads may be separately or together moved horizontally on the bed to any desired point and locked firmly to it. The carriages are made with a steel gibbed vertical slide on which the spindle heads are vertically adjusted by a screw near the slide. This screw is capable of a 6-inch vertical adjustment. On the top of this slide is the spindle head, which is capable of being swung from one side to the other, thus securing the proper hight of the spindle, which may also be swung over the lower one, as shown in the cut. This swinging spindle head is supplied with locking bolts and may be firmly locked.



MULTIPLE BORING MACHINE.

The driving pulleys, located one in each carriage, are stationary as far as vertical movement is concerned, but follow horizontally on the bed with the carriage to which they are attached. The connection between the spindles and the pulleys is effected by a knuckle joint. These joints are made of malleable iron and revolve on hardened balls, which are connected with hardened cone pointed screws.

The machine is driven by belts, one to each spindle, running from a drum under the ceiling the entire length of the machine. This will permit the carriages to move on the bed without interfering with the tightening and loosening of any belts. The drum acts as a countershaft, on one end of which are tight and loose pulleys. The table has a vertical adjustment of 4 inches, and the spindles have an adjustment of 6 inches, making a 10-inch adjustment between the table and spindle, and the table slides horizontally 10 inches.

The cut shows the table in two sections, which may be disconnected, and one half or one section used in horizontal motion, each section being supplied with a hand lever, which may be adjusted on the shaft at any desired point. The shaft on which the levers operate is in two sections, so when the tables are disconnected this shaft is also disconnected at the coupling. The entire table is readily adjusted up and down by a shaft running the entire length of the machine, which connects three screws. The shaft is supplied with cranks under the table in convenient reach.

All the sliding parts of the machine are steel gibbed, with set screws to provide for adjustment in case of wear. The machine, as shown, is fitted with 16 spindles, but can be arranged with any number of spindles desired, also any length of bed desired. It is a very convenient machine for agricultural implement, furniture and wagon manufacturers, in fact, for any manufacturers to whom a multiple boring machine is necessary.

Niagara Current at the Works of Pratt & Letchworth.

At noon Saturday, December 30, transmitted Niagara energy was applied to the great works of Pratt & Letchworth, Buffalo, and in the future this plant will consume about 300 horse-power of Niagara's force. In honor of the occasion the company issued invitations to numerous prominent people, and on their arrival at the works they were escorted over the works, following a welcome by O. P. Letchworth. It was noon when General Superintendent J. C. Bradley turned on the current and the big rotary converter began to show its influence and presence. The current is received at 2200 volts, alternating, and reduced to 168 volts, alternating, and then to 220 volts, direct current. It is then distributed to motors located in various parts of the plant and so arranged that single machines can be operated without starting all the machinery of the plant. After the power demonstration the visitors were escorted to the warehouse of the United Hame Company, an allied concern, where luncheon was served. O. P. Letchworth was toastmaster, and the principal speeches were by him and William A. Rogers.

The Pratt & Letchworth Company were organized in 1848 by Samuel F. Pratt, Pascal P. Pratt and the Hon. W. P. Letchworth. In 1895 the company were incorporated with Ogden P. Letchworth as president. Josiah Letchworth was secretary, and the directors were Franklin D. Locke, Robert L. Fryer, Josiah Letchworth, O. P. Letchworth. All kinds of castings are manufactured by the company. It is from Pratt & Letchworth that the Brooks Locomotive Works of Dunkirk receive all the steel and iron castings they use, while the Schenectady Locomotive Works get about half of their total supply from the same company. The company's business also extends to other car and locomotive builders in the United States, England, Japan, Russia, China and Australia. The company also manufacture malleable iron and steel castings of other kinds.

Pratt & Letchworth have recently purchased the large car works of the Grand Trunk Railway at Brantford, Ont., and will use them for the purpose of manufacturing malleable iron for their extensive Canadian trade. In all the company employ about 1300 hands.

The large new Black Plate plant of the National Enameling & Stamping Company, at Granite City, Ill., is rapidly progressing toward completion. Twenty-four hot mills are now in operation, and it is expected that 12 more mills will be ready for work by February next, making 36 in all. This equipment will give the company the largest individual Tin Plate mill plant in the world and one of the most complete modern establishments of its kind in existence.

The Outlook in the Iron Trade.

BY JAMES A. GREEN, CINCINNATI, OHIO.

In the familiar story of Joseph's great wheat corner the seven fat years preceded the seven lean years. At this time we trust to see history repeat itself, with the order, however, of the fat and lean years reversed. We have had seven lean years and in the iron business we certainly deserve to be recompensed. To the younger men in the trade a year ago the possibility of such a year as we have just experienced seemed remote indeed. The memory of 1895 was too recent. That was the year of glorious expectations. Its hopes were as iridescent as soap bubbles and probably as brief lived. The man who alluded to the "soda water rise of 1895" very felicitously described the situation. That year for the first time for many months the market went up by leaps and bounds, and it looked at last as if the long expected change had come for good. But the rise lasted only for a period of six months, and then the market went to pieces and the demoralization in prices and industry was worse than it had been. It was after 1895 that pig iron went to $6 at Birmingham, and no matter what may be said about the unrivaled natural resources of Alabama, no matter what may be said about the cheapness of labor there, it is impossible to profitably make iron at $6 a ton. While with every condition favorable it is doubtless true that iron can be made at $6 a ton, yet that leaves no margin for the necessary repairs, replacements and the fair manufacturing profit. But with the long period of low prices before them and still full of the broken hopes of 1895 the younger men in the trade had begun to feel as if the iron business had settled down to a point where any great and marvelous change in values was practically out of the question. Eighteen hundred and ninety-nine has changed their ideas. It has demonstrated the fact that history in the trade most decidedly repeats itself. Gray forge iron has gone from $6 at Birmingham to $16 at the present writing. No. 2 foundry has risen from $7 to $17.50 and No. 1 foundry has gone from $8 to $18.50, and these prices are not nominal in any sense of the word. They are the actual prices at which iron has been selling for months and they have been obtained without the slightest difficulty, not only for quick shipment but on orders that call for delivery 12 months ahead.

The year has seen a tremendous reversal of form, to use a sporting phrase, and to take Alabama, for instance, in January out of a total of 40 stacks there were 18 in blast on coke iron. At the end of November there were 25. On January 1 Alabama had 29,000 tons of iron in stock; on December 1 it had 6000 tons. But the most significant item of statistical information as regards the South is the fact that in Alabama there were on January 1 107,900 tons of iron in the warrant yards, while on December 1 this had been reduced to less than 6000 tons, and in forecasting the probable future of the market this fact must be taken into consideration. In addition to the public yards there were private storage yards in the South containing large quantities, and these have all been emptied.

The warrant yards in the South were like the fat which the camel accumulates in its hump and which, when food fails, it slowly consumes. The fat in the camel's hump in this particular is all gone and there is not the slightest possibility of it being replaced. During 1899, to use another simile, the warrant yards seemed, to a number of the largest consumers in the market, like a providential reservoir, from which they were able to draw their supplies as they needed them at better prices than the furnaces were quoting and with the certainty of sure delivery. It is a fact, too, that the warrant yard iron was not universally distributed among consumers by any means. The great bulk of all the warrant iron in Alabama was taken by a few of the immense consolidations which were formed in the early months of this year. In the past these consumers had been the largest customers of the Southern furnaces, and while they have bought very heavily from the iron furnaces yet the warrant iron came in for them most opportunely. What they will have to do in 1900 needs no prophet to tell.

If any iron has been sold for delivery into warrant yard the quantity is too insignificant to mention, and of course if it has been sold the prices obtained for it have been high. Certainly no iron is now going into warrant yards. An actual present experience in the matter of warrants sheds a great light on the situation in that particular. On December 19 an offer was made on the New York Metal Exchange by a *bona fide* consumer on 2000 tons at a price $1 above the published quotations of the exchange. This offer was not made for any unusual grades, but for 500 tons each of Nos. 2, 3 and 4 foundry and gray forge, yet it was found impossible to buy a single ton. Even before July 1, 1899, consumers began buying for 1900 delivery. There has been a great and steady buying movement for long forward delivery, and as a natural result the Southern furnaces begin the new year with an immense tonnage booked ahead. Not only this, but because the ironmasters anticipated making more iron than they really were able to turn out they are carrying over into the new year a very large tonnage which should have been shipped in 1899. This leaves but little iron free to sell for the first half of the year, while already a good part of the probable output for the last half has been sold. Then, too, it must be remembered that the largest producers in the South, the Tennessee Coal, Iron & Railroad Company, have started their steel plant at Ensley. This plant has a battery of ten open hearth basic furnaces and it will take a large block of iron out of the market.

No man can tell how consumption is going to keep up. But careful observation justifies the belief that it is still increasing. We do not know of a general foundry that has not more work than it can turn out on time. In fact, most of the foundrymen are like the ironmasters in that they have orders booked up to their capacity or in advance of it for many months ahead. The majority of them have bought freely for forward shipment, yet some are still taking chances on the market, while a large proportion of those who have bought have not bought all they will need and will have to buy later to complete their requirements. The mills find themselves similarly placed. Here, for instance, are the great company who have more rolling mills under one management than any other industrial organization in the world telling their customers that on certain classes of finished material they can make no more for delivery prior to September. That tells its own story.

For the greater part of this year the railroads have not been able to adequately handle the business offered them. All sections of the country alike have suffered from freight blockades and from an inability to get enough cars to move freight promptly. The year demonstrated the fact that it was impossible on short or long notice to at once put all the available furnace capacity of the country into blast, and it no less forcibly demonstrated the fact that the railroad facilities of the country, great as they are, need to be much increased to meet the demands of the situation. The extensive additions which the railroads have made to their rolling stock show that they appreciate the necessities of the time. But what they have done this year is only a modest beginning to what they should do, and fortunately for them they are handling all freight at higher rates, so that their revenues have been proportionately increased. At the beginning of the year freight rates were badly demoralized. It is a matter of such common knowledge that there is no impropriety in saying that the railroads were practically allowing shippers to fix their own rates. Early in the year the railroads were able to absolutely restore published tariff rates and since then they have advanced them materially. This increase in rates, together with the increase in tariff, will put the railroads in a position not only to add to their rolling stock but to make needed betterments and extensions. Such is the vastness of railroad interests in America that their prosperity must

ecessarily have a tremendous influence on the general business of the country. And the railroads are the foremost users of iron. They have not been deterred in the slightest degree from making improvements and additions by the increased price of iron. In fact, they waited until iron had reached a fine price before they began to be felt at all in the market as buyers. As far as can be seen, in no class of material made from iron will the higher prices as yet really operate adversely. There is no better known law of trade than that it is easy to sell goods when all prices are high and hard to sell them when all values are low. The first case means general confidence and prosperity; the other the reverse. The single exception to this is found when one hears from the makers of fencing wire and agricultural implements. They say that the farmers have so long been accustomed to certain prices that they will not pay more and that they will simply get along without new fences and implements rather than pay the prices which must now be asked. How far this is true remains to be seen. Certainly the agricultural implement manufacturers are not acting as though the situation frightened them, for they are all pushing their work.

Unless there arises some radical and unforeseen contingency this fear that present prices will lessen the demand for iron and steel finished products will prove unfounded. Prices have not gone high enough to cause any such trouble. Those making this argument are probably not taking into account the fact that previous prices were ridiculously low and out of all proportion to what they really should have been. And when prices were low an immense amount of work was postponed, put off, in fact, because there was so little confidence in the future, and this work must now be done. There are great public and private repairs that cannot now be longer deferred.

As indicating the feeling of the largest of the Pittsburgh manufacturers it is stated that they have placed an order with the Bessemer Iron Association for every ton that may be made in excess of orders already placed at the full market price to-day.

If there is an element of weakness in the pig iron situation it is hard to discover it. The advance in the prices of pig iron in 1899 rested on no boom foundations. It came from an actual demand for iron greater than the capacity of the country to supply. It came at a time when the main available Southern stocks of metal, which had been accumulated during the years of depression, had been taken up by the export trade. It was gradual and healthy. Speculation at no time entered into it, yet it is hard to say much more than this because happily we are writing not of something that is past and gone but we are writing of what now is. All the conditions that made 1899 are still in force, many of them with more intensity than at any time since the beginning of the year. Nineteen hundred opens more auspiciously than any year since the memory of most men now in active business. And it is to be hoped that the time when one can sit down and write the history of the present business expansion as a finished document is far distant.

The Growth of Russian Industry.—Of late years Russian industry has developed and expanded at a rate of which one would hardly have dreamt a few years ago. The following table, giving the sums invested in industrial undertakings during the last fourteen years, tells its own tale:

	Roubles
1885-9	35,072,000
1890-4	47,355,000
1895-8	220,354,000

A further sum of about 130,000,000 roubles has been applied to the building of the Usuri Railway, to the Russo-Chinese Bank, and to payment for ceded Chinese territories, and the question naturally arises, From whence has Russia drawn this large capital? The reply is, apart from direct investment of foreign capital within the Russian Empire, that the bulk of Russian bonds and of debentures, &c., of which the Russian Government has guaranteed the interest, have found their way to foreign countries, about 60 per cent. of the Russian national debt being held by foreigners. The extensive orders which the Government, during the last few years, has placed with home manufacturing concerns have given many of these a splendid lift, and their shares rose to what in many cases were purely fancy prices. The banks, too, did all they could to encourage the home industry, but they have since had to somewhat retrench, which fact has, of course, in many instances brought about a reaction.

The Staff of the United States Paris Commission.

The following is the personnel of the United States Commission at the Paris Exposition:

Ferdinand W. Peck, commissioner-general.
Benjamin D. Woodward, assistant commissioner-general.
Fred. Brackett, secretary and disbursing agent.

Exhibit Departments.

Appointed by the Commissioner-General.

Frederick J. V. Skiff, director in chief of exhibit departments, and director of mining and metallurgy.
A. S. Capehart, director of liberal arts and chemical industries.
Francis E. Drake, director of machinery and electricity.
Charles Richards Dodge, director of agriculture.
Willard A. Smith, director of transportation and civil engineering.
Howard J. Rogers, director of education and social economy.
John B. Cauldwell, director of fine arts.
M. H. Hulbert, director of varied industries.
John H. McGibbons, director of exploitation (acting director of textiles).
Tarleton H. Bean, director of forestry and fisheries.
Dr. Selim H. Peabody, editor and statistician.
Willard S. Ward, assistant director of mining and metallurgy.
Chas. H. Simms, assistant director of liberal arts and chemical industries.
J. L. Farmer, assistant director of agriculture.
Jas. S. Anthony, assistant director of machinery and electricity.
Lieut.-Commander Asher C. Baker, U. S. N., assistant director of transportation and civil engineering.
Henry B. Snell, assistant director of fine arts.
Lieut. H. C. Poundstone, U. S. N., in charge of naval exhibit (Department of Transportation).

Business Department.

Paul Blackmar, director of affairs.
James M. Allen, librarian.
L. H. Howland, director of customs.
Elizabeth M. Cahill, assistant librarian.
Casper S. Crowninshield, delegate, Paris office.
Frank T. Gilbert, custodian of exhibits.

Building Department.

Charles A. Coolidge, American architect.
Morin Goustiaux, French architect.
John Getz, chief of decoration, exhibit departments.
Frank Millet, mural decorations.
A. H. Mattox, press representative.

Advisory Council. (Resident in Paris).

M. P. Peixotto, Paris.
M. Nagelmackers, Paris.
G. Dambmann, Paris.

The following are the honorary special agents in the Department of Mines and Metallurgy: J. B. King, Henry W. Nichols, M. L. Fuller, C. Kirchhoff, Fred E. Saward, L. G. Laureau, W. O. Crosby, Harry T. Mercer, Dr. R. M. Bagg, Jr., Edward R. Hewitt, Victor C. Heikes, Jos. P. Iddings, Chas. F. Binns, John R. E. Booream.

In the Department of Varied Industries the following are honorary experts: Chas. E. Spratt, E. W. Dayton, Wiltsie F. Wolf, H. C. Pearson and G. F. Kunz. In the Department of Civil Engineering and Transportation Corydon T. Purdy is honorary expert.

The Standard Seamless Tube Works, the largest factory of Ellwood City, Pa., is now completed and the rolling mills were started January 1. The new works will manufacture seamless tubing by a new process of drawing obtained from Sweden. The products of the mill will be used for boilers and gas and oil well fixtures. It is understood that the Standard Oil Company will consume a large percentage of the tubing made. They expect to draw tubing from a fraction of an inch to 16 inches in diameter. The new works will be operated entirely aloft from the influence of trusts. John H. Nicholson is the superintendent of the works. The charter aplication was made by Charles E. Pope, John H. Nicholson, W. H. McKelvey, J. Erastus McKelvey and Herman J. Vedder.

Pig Iron in 1899 and 1900.

BY ARCHER BROWN, NEW YORK.

The year just ending has been unprecedented in several respects. It is the year of largest production in our history. It has witnessed an almost continuous rise in prices. It has brought changes of far reaching significance in the ownership and control of our iron and steel industries. It has demonstrated the comfortable truth that our export trade is not dependent upon an accidental condition of low prices in America and high prices abroad. It has brought wages of skilled and common labor to the highest point yet known in the industrial world, if they be measured by their power to purchase the comforts and luxuries of life. It has changed hundreds of millions of dollars of capital invested in the railroads of the country from the losing to the profitable side of the ledger. It has done the same thing for tens of millions invested in iron mines, furnaces and mills. It has put idle capital into employment and advanced the value of money (as expressed in interest) fully 25 per cent. the world over. It has changed the pessimist into the optimist, and restored confidence in the boundless resources of this great land and of its people. And incidentally it has brought new financial and economic problems for thoughtful men to consider.

The rise in prices began in December, 1898, but had barely expressed itself further than in a great increase in activity when the new year opened. We began the year producing a little less than 12,000,000 tons pig iron; we ended it producing 15,000,000 tons. The total output of the year will prove to be about half way between these figures—an increase of 12 to 15 per cent., or about as was predicted by well informed observers early in the year. The advance in prices went slowly at first, for there was general skepticism that the real thing had at last come. Hence it was that when prices were up 10 to 20 per cent. most of the furnaces and mills of the country loaded themselves with contracts for months ahead. Many a pig iron maker and not a few foundries, rolling mills and steel works are dealing with these low priced contracts at the very end of the year, and fortunate they are if the enhanced cost of production has not overtaken the selling price so as to net the maker a loss on such business. In general, however, the year has been exceptionally profitable.

It is perhaps not too much to say that the value of all the ore mines, blast furnace property, steel works and rolling mills in the United States is twice as great January 1, 1900, as it was January 1, 1899. Certainly this is true if we speak of the available or selling value of the properties. The enormous influence of such appreciation on the business of the country is too obvious to need argument. It is felt by the railroads, the banks and by general trade. Iron is the thermometer, if not the barometer, of the country's business, and when the manufacturing of iron in different forms is so unprofitable as to vastly depreciate the value of mines and mills it is safe to say that prosperity in other lines is yet a long way off. The statistical records of *The Iron Age* are so complete that it remains for me only to comment on general features of the trade. Looking forward into the new year there is perhaps greater eagerness than ever before to know what it has in store for us. Can we maintain and increase our great rate of production without disaster to prices? Are costs going to mount up so fast, through advances in freights, labor and raw materials, as to make the last state of the furnaceman (and foundryman, too) worse than the first? Will the effect of the great combinations be to steady or demoralize prices if weakness comes? Will the Wall street flurry just prior to Christmas be felt through the channels of business? Will the high prices of materials check new enterprises involving construction? Will our export trade hold up when nearly every article shipped abroad must bring 50 to 100 per cent. more than a year ago? There are other queries to puzzle and confuse the timid, but perhaps these are enough.

There is no room in this hasty review to canvass the arguments on both sides of these problems. A few general statements must suffice. And they will be from the standpoint of one who believes that the American iron trade, instead of having reached its climax, is just on the threshold of its great career. The lean years following the panic prepared it, through the lessons of adversity, for the conquest of the world. Every fact of modern life goes to prove that the geometrical ratio of increase of iron consumption which has prevailed in the past the world over will not cease in the next decade, if it does in the next century. If we made 13,500,000 tons of iron in 1899 we will make 27,000,000 tons in 1909. To prepare for an average annual increase of 10 per cent. will require rapid expansion of mines, transportation facilities on land and water, the building of furnaces and mills, the employment of tens of millions additional capital and tens of thousands of more mechanics and laborers. There will be periods of backset, but the onward progress will be certain.

America made 40 per cent. of the world's iron in the year past. This proportion will steadily increase because of our immeasurably greater natural resources, superior plant and more active and intelligent labor. We shipped $100,000,000 of iron and steel products abroad in 1899. We shall do more next year, unless the home demand carries prices still higher.

It would be healthy if prices all the way from the ore and coke through to the finished forms should shade off from 10 to 25 per cent. But with the great reserve demand that has been built up by delayed work the past year it seems very improbable that any considerable decline would last. The lower prices would go the greater would be the flood of work released and the quicker and more extreme the reaction. And it must be remembered that if there is any scramble for material in 1900 there are no stocks to go to and no half idle mills and furnaces to fill up, as in 1899. There is not a four days' supply of pig iron in the United States, and scrap, which for the moment is reasonably abundant in yards, has been gathered until the country is bare of it. Taking scrap and pig iron together the new year starts with 1,000,000 tons less than the old. We are making 3,000,000 tons more pig iron than a year ago and melting every ton of it as fast as made.

Wild statements were made early last year as to the great increase in output of pig iron that high prices would bring out. They came some of them from quarters thought to be well informed. The event has proved how grossly they were at fault. We now read that the new furnaces building and contemplated will add 5,000,000 tons to the output of 1900. Cut that in two in the middle and you will have the maximum attainment of American enterprise, energy and capital. We should make 16,000,000 to 16,500,000 tons in 1900, and (barring unlooked for political troubles in Europe or financial or political troubles at home) we will need it all.

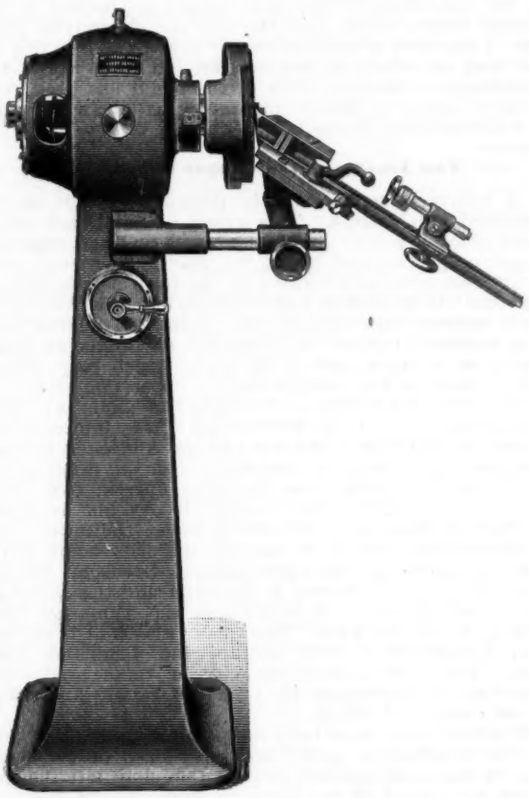
The National Tin Plate Company of Wheeling, W. Va., this week increased their nominal capital of $1000 to $5,000,000. J. C. McDowell was elected treasurer, with the following Board of Directors: Ex-Governor James A. Beaver of Bellefonte, Pa.; Senator N. E. Whittaker of Wheeling, W. Va.; W. H. Rogers of Wheeling, and A. B. Daily of Pittsburgh, Pa.

The Navy Department and the Lighthouse Board of the Treasury Department are arranging a plan for the establishment of wireless telegraph stations on lighthouses and lightships in the United States. A series of experiments are contemplated, to be conducted on naval vessels and in lighthouses, to ascertain how the system may be improved before there is any attempt made to install it permanently.

A syndicate headed by Tom L. Johnson and his brother Albert will build an electric street railroad in Honolulu and on Oahu Island in Hawaii.

The Eames Electrically Driven Drill Grinder.

The G. T. Eames Company of Kalamazoo, Mich., have recently brought out the electrically driven drill grinder here illustrated. The machine, as is clearly shown, has the motor, frame and stand cast in one piece, the controlling switch being located within the hollow column and operated by the handle shown on the side. The motor is very solidly made, especially to stand rough usage, with bearings self oiling and extra large to insure long life. The bushings are of gun metal and easily renewed. The drill grinding mechanism has few parts to adjust, and possesses special features such as the device for giving a variable clearance to all sizes of drills within the range of the machine, which is a characteristic of extreme importance. An advantage possessed by an electrically driven grinder is that it may be located at any place desired, and connected quickly to the nearest power circuit by wires which can be led in any direction. It requires no pulleys, countershaft or belting, and when once installed the cost of maintenance is reduced to a minimum.



THE EAMES ELECTRICALLY DRIVEN DRILL GRINDER.

Central Pennsylvania News.

HARRISBURG, January 1, 1900.—Should the strike among the bituminous coal miners of Pennsylvania assume the proportions which the leaders of the miners' organization predict, there will be serious consequences among the mills and factories of this section of the State. Under the pressure of day and night operations for several months the iron and steel plants have consumed the coal as fast as delivered and recently the deliveries of fuel have not been nearly equal to the demand. Indeed, the shortage of coal caused the Pennsylvania Steel Company the most serious embarrassment during the past week, when one of the blast furnaces was banked for want of fuel. Other departments of the great plant have been hampered in the same way so that shipments have been delayed and the company begin the new year 30,000 tons of steel rails behind the date of delivery. It has been simply a physical impossibility to keep up with the demand for rails with the aggravating delays in the coal shipments. Of course the car famine on the railroads has had much to do with the trouble in this respect, but the tremendous pressure of day and night operations at full capacity in all departments of the works explains in some measure the present difficulty. Should heavy snows blockade the railroads in the coal fields for any length of time it is as certain as anything that the mills in this district would be compelled to shut down. During the present stock taking period there will be renewed efforts to get in a stock of coal, but the shipments of fuel are not sufficiently heavy to hold out much hope in this direction. Such a serious coal shortage has not been known in many years. A few of the smaller mills have been able to stock up with coal, but even these advance supplies are not in large quantities. The coal carrying companies seem unable to cope with the situation now, and a great strike of coal miners at this juncture would be in the nature of a calamity.

The large mills of the American Tube & Iron Company at Middletown have closed down for two weeks to take account of stock and discover just where they stand with respect to orders. The Lochiel Rolling Mill in this city, whose product is largely used by the tube works, has also shut down for a week or two. Other mills are also off during the annual stock taking, but the managers all agree that the suspensions indicate no lack of business. There are plenty of orders to keep all going well into the new year. Some of the mills and factories have enough orders to insure steady running until next summer.

There has been a shading off in prices for all kinds of iron except pig and the extraordinary demand for this kind of iron will probably maintain the present stiff price. Most of the iron and steel men in this territory expect to see a considerable drop in the price, but they say that this change will be rather helpful than otherwise. They go upon the theory that a return to something like normal prices with the present and prospectively large volume of business would be infinitely better than a continuance of boom conditions and a sudden stagnation of the iron and steel industry as the result of prohibitive figures not only on the raw material, but also the finished product. A prominent ironmaster of wide experience in the Central Pennsylvania trade said to a representative of *The Iron Age* that he would be glad to see the prices slide back gradually on both the raw materials and finished product. In his opinion it would be a guarantee of a prolonged and profitable period in the iron and steel industry. He has great faith in present conditions, but fears any prolonged inflation of prices may discourage the projectors of large operations requiring the products of iron and steel. It is a fact that many enterprises have been halted during the last six months on this account and the downard tendency in prices will have the effect of bringing to a consummation many of these undertakings.

The Susquehanna Iron & Steel Company at Columbia are receiving estimates for the erection of their new pipe mill, which they hope to have in operation next fall. It will cost $750,000. This mill will be a part of the new Atlantic Iron & Steel Company, which will also embrace the Susquehanna, New Haven and Danville Bessemer properties and a rolling mill at Schuylkill Haven. The combination will be effected during the latter part of this month. The stockholders of the New Haven and Susquehanna companies will receive 150 shares of the preferred stock of the Atlantic Company for each 100 shares of their present holdings. They will also have the right to subscribe to the common stock on favorable terms. The Danville Company will hardly be included at the start, but will be taken over by the combination after a dividend has been declared. The Susquehanna paid the usual quarterly dividend of 30 cents a share on Saturday, and the New Haven Con pany a dividend for two months of 20 cents a share.

Owing to the Christmas suspension of the mills in this district the output for the week was not as large as usual, but the January running will be heavy in all the mills having supplies. The bridge and construction departments of the Pennsylvania Steel Works, always crowded, have been held back by the shortage of material resulting from the shortage of fuel. The large stock house near the Bessemer plant was destroyed by fire on Saturday.

Railroad men say that the shipments have never been so heavy, and the rolling stock and roadbeds will have to be renewed in many cases during the present year.

It is officially denied that the Pennsylvania Steel Company have acquired the Pine Grove Furnace.

Hibner & Son of Philadelphia purchased 67,000 feet of water pipe at Camp Meade for $11,565. S.

The latest report of the American Pig Iron Storage Warrant Company shows that the net stock of pig iron in yard was 4900 tons on December 31, 1899.

Under the title of "The Growth and Rights of Aggregated Capital," there has been reprinted in pamphlet form the argument of John R. Dos Passos, the well known attorney of New York, before the Industrial Commission at Washington.

The Copper Industry.

Developments in 1899 and the Outlook.

Prices soaring above the point which Secrétan dared to peg them at for a few months, that was the striking feature of the past year. It has been a fact all the more remarkable because natural causes brought about what the most ambitious and most disastrous corner in the metal industry could not have accomplished. Long years of agony followed the collapse of the Secrétan bubble, while no one expects that the present period of high prices is to bring in its train any protracted suffering. Still high values for the metal have lasted long enough to prove that a readjustment must come—as a matter of fact it has already begun. Electrolytic copper has sold recently as low as 15¼ cents, and it is admitted that no large quantities of Lake could be placed now above 16 cents, if, in fact, that figure could be realized.

On the other hand, the general conditions as to consumption and demand are so sound that no collapse need be feared. In other words, it looks as though there may be a gradual decline to a safe intermediate level, say 13 or 14 cents per pound.

The Supply.

The developments during the past year seem to emphasize the teachings of the Secrétan boom, and that is that high prices are not immediately followed by a notable increase in the production. That impression, it is true, is created by the appearance of many new enterprises, for which extravagant promises are made by promoters both as to tonnage and as to the time. Only a small fraction of these promises are realized, yet in the aggregate the expansion of the old concerns, and the driplets from the new ones, throw enough into the delicately poised scale of demand and supply to force the price pointer back to its normal position and beyond.

The fact must not be forgotten, either, that the world needs an annual increment to its production to satisfy the steady swelling in the requirements which comes from the increased and intensified activity of its industrial nations and the spreading of civilization among backward communities. In recent years this has amounted to at least 8 to 10 per cent., subject to the impulses and retardations forced by general conditions. The great rise of 1899 is a proof that, relatively, production has lagged behind, and, generally speaking, has been due to the fact that while the world's demands have been heavy in recent years, the requirements of the United States had not proportionately increased. When, then, during the years 1898 and 1899, this country began to very greatly expand its demand as the results of a widespread activity, then the additional enormous strain placed upon the supply forced values upward. Our home markets readily took not alone all our increased product, but forced a reduction in the exports which transferred the strain upon the world's markets. Our consumption has therefore become the governing factor.

The figures compiled by John Stanton of the Copper Producers' Association show that in the first eleven months of 1899 the production was 238,418 gross tons, or say 270,000 tons for the year, as compared with 234,000 gross tons in 1898. At the recent rate of production the 1900 output will be 280,000 tons. It must be remembered that the increase in 1899 is the result of a straining of all the resources of the mines and works of this country, great and small. Since they were all under high pressure in 1898, which was a prosperous year, at the range of prices then existing, there was little reserve capacity available. In the aggregate considerable additional copper came from a multitude of small sources.

But, after all, the serious question is to what extent improved and added facilities of the old mines and the entrance of new properties are likely to further swell production.

In the Lake country a very considerable number of new enterprises have been started, the majority of them with a working capital large enough to provide for work for some time to come. Some of them may fail to receive much cash when the day for further calls for funds comes. But, putting them altogether, their product is not likely to cut much of a figure in the statistics for 1900. The increase, which will certainly not be large, must come from the old properties.

In Montana the decline of the product of the Anaconda during 1899 has done much to offset the increase in other sections. It has more than balanced the growth in the operations of the Montana Ore Purchasing Company's properties and in the resurrected Boston & Montana. To what extent the Washoe will fill the gap in 1900 remains to be seen.

In Arizona some increase will come from the Phelps-Dodge group, and possibly the Arizona Copper Company and the famous United Verde may add to the output. Then there are quite a number of small new mines which will, taken together, increase the supply quite notably.

Utah has increased through the operation of the Highland Boy and is likely to expand still further. The same may be said of New Mexico and California, where the Ames estate is putting up a large plant at the old Union mines in Calaveras County. In the South the Ducktown district will swell its contribution to the supply, while in New England the Tysons are building large works at Elisabeth, while the Ely and the Milan mines are being revived.

While, therefore, there is no likelihood of any sudden flood of new copper, it is a fact that the recent rate of production of 23,000 gross tons per month will not only be maintained—barring accidents—but that it will be slowly but steadily increased.

One circumstance deserves mention, as having to some extent affected the supply by diverting copper from the market. There has been a very large increase in the percentage of the total copper production in the United States which goes through the electrolytic process. From first to last the copper thus treated is tied up for from six weeks to two months. In other words, the metallurgical working stock of the metal has been very greatly added to, thus temporarily withdrawing quite a considerable tonnage of the current output from the market.

The Amalgamated Copper Company.

A relatively new factor in the copper trade is the Standard Oil interest. This group of capitalists some years since began to take an interest in Lake Superior copper properties, and during the year 1898 entered upon a comprehensive undertaking in the form of rehabilitating some old properties under the style of the Arcadian. Their interest grew rapidly, and during the current year they acquired control of a number of producing companies in Montana and on the Lake which they undertook to float as the Amalgamated Copper Company. It has never been officially stated what the holdings of this aggregation are. It is known that these interests acquired the majority of the stock of the Anaconda Mining Company, purchased for $4,000,000 cash the property of the Parrot Company from Franklin Farrell, took over the Santa Rita in New Mexico at $1,400,000 and acquired the Copepr King near Merced in lower California. It is believed that they have also the majority holdings of what is known as the Clark-Bigelow-Lewisohn group, which includes the Boston & Montana and the Butte & Boston companies in Montana and the Tamarack Osceola group on the Lake. They have also control of the Utah Consolidated, who operate the Highland Boy mine. The total annual capacity of these producing properties is somewhere between 250,000,000 and 300,000,000 pounds of copper.

Whatever may have been the plans, the complete collapse of the effort to market any large share of the stock issue of the Amalgamated Copper Company left the interests in control of the issue to face the problem of working the properties as producers of the metal pure and simple. If there had been any idea of making a speculative turn only, that must have been abandoned, and the men who conceived the Amalgamated Copper Company are now in the copper industry to stay, for a while.

The concentration in one control of a product of upward of 250,000,000 pounds of copper per annum is in itself a fact of the greatest significance. It does not imply monopoly, because there are several important groups quite independent of it. These include the Calumet & Hecla, the Phelps-Dodge Arizona properties, the United Verde mine of Senator Clark, the Quincy, the Heinze interest at Butte, the Stanton group on Lake Superior and other individual producers. We have observed that notably the English press has been lashing itself into quite an unnecessary pitch of fury over the monopolistic tendencies of the American copper trade. Still, the fact must be taken into consideration that an important concentration of interests has taken place and that a new factor has entered the industry. Apparently the commercial management for a considerable time lacked a certain vigor and directness of purpose which was very puzzling to the copper trade.

Mines Poorer in Depth.

One fact which is likely to have a very important bearing on the future of copper prices should be constantly kept in mind by consumers of the metal. We allude to the decrease in the grade of the ore as greater depth is attained. This is particularly true of the great Butte district, although it applies, generally speaking, to other mineral deposits outside of Lake Superior. It is now acknowledged that the mass of the ore in the lower levels of older Butte mines goes down to 2½ to 3 per cent., and that that average is only brought up

by the existence in the veins, even at the low depths, of smaller rich bodies of ores, which, at first in abundance, constituted the early bonanzas of the great camp. These bonanzas have decreased in quality and have lessened in number and extent. The result has been that the yield of the ores handled in the Butte district has steadily declined until now, or in the early future, only relatively low grade ore will be available. This means either falling off in product or increased capital investment in plant. It means, however, above all that the Butte miners cannot expect to market their copper at as low a price as they have done in the past, in spite of the reductions in cost which better technical management succeeds in effecting. It must be stated, however, that there are in the Butte district a number of mines in reserve whose appearance may considerably modify, temporarily, the inevitable trend of events. Some of these properties are tied up by litigation.

The same tendency toward lower averages is manifest in the older Arizona districts and in California. As a matter of fact, with few exceptions, the principal producers in the United States are becoming more and more dependent for their successful and sustained operation upon the treatment of great quantities of low grade ores.

This means increasing cost, in the long run, so that the low water mark of the days when we were skimming the cream of our resources may not be reached again except by a slow process of chipping off costs by a multitude of small economies.

During 1899 costs of production have been increased, at least temporarily, by higher labor, notably on Lake Superior, by higher cost of fuel and of supplies and materials, and by a general advance in the freight rates from mine to market.

The Outlook.

The climax in the high prices was reached in October. At that time one of the leading companies endeavored to market considerable quantities abroad, without much success. Then came in November the sale by a large Lake interest of 15,000,000 to 18,000,000 pounds of Lake copper to home consumers at 17 cents, for delivery to March. It is understood, however, that this price is guaranteed. The manufacturers entered into this transaction in order to forestall any sudden drop in prices which might cause a demoralization in the trade. Some interests were free sellers during this period, while other large groups were steadily accumulating unsold copper. It has become quite evident from the increasing spread between Lake and electrolytic copper that some of the Western mines have been forcing sales and that the metal is tending back to a sounder and safer level.

In our own country the consumption has been tremendous and it has been particularly large in the manufacturing channels and in the general metal trades. The requirements for electrical purposes have been very large, but the copper industry will be forced more and more to face the fact that, relatively, the demand from this source will decrease in importance. The improvements in electrical machinery have tended in the direction of making smaller sizes in copper conductors available and aluminum has undoubtedly conquered a prominent place. It must be remembered, too, that the copper which has gone into use for electrical purposes is not actually consumed or destroyed, except possibly in underground lines. We may witness the development of quite an industry in the redrawing of copper conductors which may cut into the demand for new metal.

We are then in the copper trade face to face with the same question which puzzles all connected with the iron, steel and metal trades generally, whether consumption is likely to continue in this country at the tremendous rate of the last half year, and if not, whether more normal prices bring out a latent demand. Among consumers the general conviction is that prices are too high, and that to maintain them will mean the permanent loss of business.

Already European manufacturers have become cautious over the dearer money in the leading financial centers, which has affected them more than it has our business men, who have been taken care of at rates which are fairly normal. In the foreign demand, therefore, there has been some hesitation lately so far as the general trade is concerned. An important new demand, however, has cropped up which may offset what decline there may be in other directions, and that demand is for military purposes on the part of Great Britain. Already very large orders for copper and for cartridges have been placed here and elsewhere, so that we may find producers of the best grades of raw material enjoying a very large business.

All these circumstances point to the conclusion that if the recent softening of prices continues it is not likely to be precipitate. In the long run all the producing and consuming interests will be most benefited by a gradual return to normal values from the dangerous pinnacle of 1899.

The Position of Spelter.

Somewhat unusual developments have characterized the zinc industry during the year just past, the effect of which has been to place it on a much sounder foundation. In the East the manufacture and sale of the high grade metal is now closely controlled, and a healthy growth is taking place. It is in the West that somewhat extraordinary changes have taken place which tend in the direction of more effective mining and manufacture.

The Joplin-Galena district had an extraordinary boom in 1899, outside capital going into the mines of that district with a rush. There can be no doubt that much property was floated on the public at extravagant valuations aided largely by the effort made to sustain the high prices of ores through a co-operation among the producers. The result was a protracted struggle between the associated miners and the smelters, coupled with some very violent fluctuations in the market price for the metal. While it will be admitted that the old method of selling the ore in small parcels to the ore buyers representing the smelters was not conducive to the best results to the producer, it is true, too, that the miners were somewhat intoxicated by their newly acquired power and the boom spirit. The idea became prevalent that the ore producers had the whole industry by the throat, that they could dictate prices which the final consumer of the metal must be made to pay, that our own market could be handled without any reference to European conditions. For a while the heavy consumption of spelter for general purposes and for galvanizing in particular gave encouragement to that idea. But when spelter previously exported began to return, when the galvanized sheet industry showed evident signs of distress, when smelting plants began to close down in increasing numbers, and when it became evident that an export pool to which the mine owners had to contribute became necessary—when the potency of all these circumstances became manifest, then, at last, in December, there came a truce between the warring interests.

One very interesting and suggestive departure was taken toward the close of the year in the Joplin district, and that was the closing of a year's contract between the American Zinc-Lead Company and the Illinois Zinc Company, at Peru, Ill., based on a sliding scale, the price of ore advancing and declining with the market price of the metal--a rational course, which it is hoped will be widely imitated. Another reform is that moisture determinations are made.

The advent of associated capital has brought about marked improvements in the method of mining and in the character of plant and equipment. Hitherto the industry has been largely in the hands of small groups of working miners, of moderate means themselves, or backed by small capitalists. A good deal of the plant has been of the crudest character and the methods have been wasteful to an extent not warranted even by the irregularity of the deposits. In the long run the change is bound to tell upon the cost of production and is sure to redound to the benefit of the district and the position of the spelter industry of the United States. For the present, however, the increased wages have enhanced the cost, and it is believed by good authority that while five years since $21 ore did not lead to serious hardship, $27 ore would now cause a sharp falling off in the supply.

As bearing upon the general question of the vitality of the industry, it should be noted that there have been considerable improvements in the technical details of the smelting of zinc ores. This is more particularly true of the calcining of the blende. Modern very efficient automatic roasting furnaces have been introduced and for the zinc distillation gas has become the prevailing fuel. The discovery of the natural gas belt of Kansas has wrought a revolution in the smelting. It has for the time being brought about an excess capacity—a matter, however, which is bound to readjust itself. Incidentally it may be stated, however, that the first signs are appearing that here as elsewhere in the United States natural gas is only a temporary blessing, whose ultimate and greatest benefit is that it teaches the advantages of fuel gas.

In Europe the high price of the metal which was reached during 1899 could not be sustained. It looks, however, as though powerful influences were at work to prevent a decline below £20.

In our own country there are welcome signs that a broader and more intelligent commercial policy is gaining ground in the Western industry. Lately some export sales have again been effected, and indications are not wanting that consumption is again proceeding at a heavy rate. The outlook is hopeful for a well sustained development, profitable to all interests, without the danger of imposing onerous burdens upon the consumer.

The Iron Age

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The Paris Library of The Iron Age.

Preparations for the Paris Exposition have now progressed so far that the available space has been practically allotted and a preliminary list of the exhibitors has been given out. It was quite evident at the outstart that only relatively few representatives of our leading industries would secure adequate space and that facilities would be wanting to direct foreign buyers to the sources of the endless variety of products of the metal trades.

Realizing that this constituted an opportunity to do good service to the metal and allied industries, the publishers of *The Iron Age* brought to the attention of the United States Commission an undertaking which met with their cordial approval and co-operation, and led to the assignment of a well located space for the exhibit in the Department of Mining and Metallurgy close to the stairway which leads to the gallery in which the hardware section is installed.

The plan consists in gathering and exhibiting at the Paris Exposition a Library of the Commercial Literature published by the American manufacturers of iron, hardware, machinery and metal goods generally. It will consist of the catalogues, price-lists, circulars, section books, description of plants and other commercial printed matter in these lines.

All manufacturers of any class of metal goods are requested to send us their printed matter for this library. We would be glad to have the collection include every printed document used in the trade. No charge whatever will be made in any form. No goods will be sold. No special prominence will be given to any manufacturer. Our recompense will come from the opportunity to increase our already extensive foreign circulation, and from the satisfaction of doing a service to the industries we represent.

A catalogue giving the names and addresses of all manufacturers represented in the library will be distributed at the exposition, and widely circulated by mail in the various European countries. As it will indicate concisely the character of their products, it must be of benefit to those manufacturers who are included in it. It will form a live directory of the American metal trades which cannot fail to attract the attention of the foreign trade to American goods, as well as draw visitors to the library. It will contain no advertising.

The library will be handsomely fitted up with conveniences not only for storing, but also for comfortably consulting the documents of which the library will consist. Our installation has been designed by the architect of the United States Commission, and will be built and set up by the official contractor. It is therefore sure to be not only creditable in appearance, but also in harmony with its surroundings.

The library will be in charge of competent persons, speaking English and French, able and willing to aid those desiring information about American metal products. It will be carefully arranged, indexed and catalogued in such a way that foreign buyers will be able to find any catalogue or price-list they may desire, and to study any subject in which they may be interested. It will include the current numbers of *The Iron Age*, as well as files of this publication.

We feel convinced that the undertaking, whose main features we have outlined, will prove of much service in promoting the export trade in American metals and metal goods, and we feel confident of the co-operation of American manufacturers who will favor us by a prompt response.

The New Year.

Such huge interests are at stake in the iron, metal and machinery trades of this country that a clear presentation of the influences at work in shaping events is of vast importance. The study of recent events, however interesting it may be from a historical point of view, has little significance for the merchant and manufacturer, unless it enables him to judge of the forces which have determined them. Our industrial life is so complex, it is influenced by so many conflicting causes, among which sentiment plays so important a part, that there must be many differences of opinion as to the potency of this or that factor. Still some salient features usually catch the eye of all observers, and some new problems engross more than others the attention of the vast majority. We print elsewhere a series of reports relating to the principal basic industries, the perusal of which will prove a profitable task.

The one cardinal fact which is conspicuous in all the reports printed is that there has been an extraordinary demand along the whole line, coupled with exceptional profits in many branches. The all-absorbing question, when dealing with the future, is whether this stupendous demand will not alone continue at its 1899 rate, but whether it will be large enough to take care of constant and steady, though small, additions to output. The most serious and the most debatable phase of this question is whether present prices, admittedly high, will cut down requirements enough to throw the balance against the makers.

Many in the trade insist that prices cannot be maintained indefinitely in articles on which not a few but the vast majority of producers are making unusual profits. The conservative element in our iron and metal industries hold that the maximum benefit to those who have long been in the business and now propose to stay in it will come from a gradual return to a more normal level of prices. They doubt the wisdom of measures which aim at holding values by main force, a course which is in itself a confession that the situation is overstrained.

The fear is widely expressed that the first indication of a decline must be the signal for a disastrous collapse. Recent experience does not justify such fears. We have seen steel plates descend from dizzy hights under the pressure of an increased supply without any demoralization. Copper has been receding from the banner price of 18½ cents per pound without disorganizing the whole industry. As a matter of fact, the general situation is so strong, there has been so little speculation and overtrading, that an orderly retreat may be effected without the danger of a general rout.

Thus far very little outside capital, relatively speaking, has rushed into the metal industries. On the whole, there is a healthy expansion from within the ranks in nearly every department. But if the temptation of present prices is too long dangled before moneyed men seek-

ing profitable investments we may have a repetition of the wild building of plants which it takes such long and, to all, painful pressure to crowd to the wall.

It would seem, then, that now more than ever before, conservative counsels should prevail, and that the powerful interests now so largely in control should work toward the establishment of a sound level of prices.

An Example Worth Considering.

The beginning of the new year witnessed the opening of a new line of shipping to connect Germany with South America. Steamers are to ply regularly between Hamburg and points on the river Amazon up to 1000 miles or more from the seaboard. This fact deserves to be considered from a broader viewpoint than that of a mere addition to the facilities of an already large shipping company. It is an indication of the tendency of the efforts in the contest for foreign markets of a country which is making gigantic strides, and the success which has attended her efforts makes it worth while for the people of competing nations to consider the methods which have enabled such success to be attained.

German trade with the Amazon is no new thing. Manufactured products of that country long have found a market in Northern Brazil, besides which German merchants and German capital have been employed profitably in effecting the exchange of native Amazonian products with the whole manufacturing world, and all this while depending upon the shipping facilities afforded by foreign powers. The chief export staple of the Amazon districts is India rubber, and almost from the beginning German merchants have taken the lead in marketing this product, though the greater part of the consumption has been in other countries than Germany. No merchants have been more enterprising in pushing their way into the interior of the South American continent than the Germans, and in many cases they have superseded the merchants of other nationalities who were first to become established in that field. The pioneer line of ocean steamers in the Brazilian trade was one subsidized by Great Britain so heavily, in the shape of mail pay, that for some years the payments to the packet company exceeded the postal receipts from that quarter by $1,000,000 annually. Yet a service established at so heavy a cost—to say nothing of the investment of private capital in the enterprise—failed to retain control of the trade, and there are now lines of steamers touching regularly at Amazonian ports that are owned in several European countries. The latest addition to the list is that mentioned above.

The new Hamburg enterprise is not coming into existence because of any serious lack of shipping facilities. But the German people do not want to be dependent upon foreign shipping; rather, they want to add to their wealth to the extent of the profits on their ocean trade in certain directions which hitherto have been pocketed by foreign shipowners. To take a single instance, the consumption of India rubber by German manufacturers has doubled within a few years, and a large percentage of the raw material has been derived from the Amazon. Latterly, the price of rubber has become so enhanced as to reduce materially the rate of dividends paid by the leading manufacturing concerns. But if the same capitalists had owned an interest in the shipping business their declining profits might have been offset somewhat by the profits on transportation. For some such reason as this very many manufacturers in Germany to-day have something invested in the business of controlling supplies of raw materials, at some stage or another, in different parts of the world.

In fact, Germans generally will be found to be interested in some manner in the shipping interest, until their country now has the largest single commercial shipping company in the world, and the nation as a whole practically has declared its independence of foreign shipbuilders. They have seen British workingmen and engineers profiting by the wages paid in shipyards and in the production of equipment; they have seen other British subjects in large numbers supported by their wages as seamen; and they have seen the national wealth of Great Britain enhanced by the profits of the carrying trade and even by the profits of the insurance of cargoes. They have become aware, also, that all of this advantage to British interests has imposed a substantial tax upon German commerce, and it is for all these reasons that the new German spirit is opposed to a continuance of the old *régime*.

It is worth reflecting whether the example of a nation which has manifested so much enterprise in the promotion of its shipping interests, and with such good results, is not worthy of emulation. In respect to general industrial development, it is long since the United States has had any reason to fear comparison with older countries. In mercantile lines American genius has been found capable of dealing with whatever problems our people have seriously addressed themselves to. In respect to skill as ship designers and builders, Americans have not been found lacking. But it is hardly in keeping with their enterprise in other respects that the marked increase in the volume of our foreign trade within a recent period should not have been accompanied by such progress in the control of our own carrying trade as to lessen the percentage of the charges on that trade which goes into the pockets of foreigners. By the way, it is not alone for English trade or German trade that the merchant fleets of those countries are designed; their ships are available for cargoes from every port to every other, just as we see them employed largely in the American carrying trade.

Success in the expansion of American shipping need not necessarily mean the driving from the seas of other ships; it would at once restrict to some degree the carriage of our own exports and imports to American vessels, but there are prospects of the growth of ocean shipping in new quarters to such an extent as to require a constant increase in the world's tonnage, and it seems only reasonable that American capital, American skill, and American enterprise should be devoted more largely than in the recent past to creating and controlling an important share of this growing total. And there is apparent no reason why American requirements in the way of merchant ships should not be met at home as well as our requirements in the way of war ships, or even of locomotives, or steel rails, or machine tools, or tin plate.

There has been evident at times, in this country, too great a disposition to depend upon the Government for some sort of financial assistance in the matter of ship building. It is true that, at various times, the British Government has disbursed large sums of money, in the shape of mail pay to shipping companies, which in the opinion of some authorities would have been charged more properly to the promotion of commerce, but, however this may be, the greater part of British shipping to-day is carried on by lines which have never shared in these subsidies. France has been more than liberal in the matter of public aid to her shipping interests, but those interests are stagnating to-day. Nor has the German Government ignored the demands of her shipping for support, yet her largest commercial shipping company has been developed without subsidies. Whatever in the past may have been true, or seemed true, with re-

gard to the propriety—or the necessity—of Government subsidizing ships, it ought to be evident by this time that the country which eventually is to be supreme in the shipping trade of the world will not become so on account of the payment of subsidies. The American people have been able to develop an unparalleled transportation system on land by means of private enterprise and the employment of private capital. Why should it be more necessary to depend upon Government aid in the building of ships? This question is the more pertinent in view of the success of the American shipping trade before the period when railway building began to absorb to so large an extent the capital of the country.

The Education of Mechanical Engineers.

The paper that attracted the greatest attention and elicited the most discussion at the recent meeting of the American Society of Mechanical Engineers was on the education of machinists, foremen and mechanical engineers. The author, M. P. Higgins, had had charge of the Washburn shops of the Worcester Polytechnic Institute for a quarter of a century and therefore spoke with the authority of long experience. He believed that "the engineering colleges cannot keep up with practical work unless a commercial shop is maintained, and the only way that such a shop can be maintained is by producing the best modern work by the latest and best methods and by subjecting the products of the shops to the impartial and excellent test of the open market." This method would combine the instruction necessary for the production of an article of such quality and under such economic conditions that it might cater to the market in competition with the regular output of manufacturing establishments. The author thought that it would be a narrow claim for the school shop to say that its only aim is to teach the use of various machine tools, and to ignore the strictly commercial side of the problem. The point is made that the graduate of an engineering college, in addition to being able to talk intelligently about machinery, must be able to build the best machinery at a less cost than others. The importance of being able to secure wise, economical shop management of the kind manufacturers require is emphasized. One favorable aspect of the problem is shown by the fact that the Washburn shops were more than self supporting from 1891 to 1895 inclusive. The current expenses of the shops were made up of all unproductive expenditures, including coal, gas, insurance, &c., and also the superintendent's salary, together with every hour of unproductive labor devoted to instruction.

The author advocates the half time plan—half to instruction and half to shop training or practice. It is claimed that this method would result in a more expert knowledge of the machinists' trade, and a more practical skill in its various departments "than is generally secured by any apprenticeship in this country or Europe." In the Washburn shops less than one-third of the three years' course has been devoted to shop work, and yet the graduates have always enjoyed a high reputation for practical skill and shop experience. It is thought that the proposed plan would produce far better results.

One of the most important features is that devoted to the "special care and method of selection of pupils who have finished the grammar school course, and who have special aptness for mechanical work." This means the fitting of the education to the boy and not the boy to the education. The boy is to be sought out and then trained. The inherent aptitude of the boy is to be studied and then his ability developed along lines in unison with his qualifications. By this means the best material would be placed amid the most advantageous surroundings and the result would be an advance upon anything now accomplished. The author states that the school board of any town desirous of establishing one of these half-time schools should change the course so as to meet the requirements of a boy with a mechanical bent. This appears to be as reasonable and as imperative as the demand made by the boy who wishes to be prepared for college.

In the discussion of this paper Geo. W. Melville, Engineer in Chief, United States Navy, said that the theory advanced seemed most perfect. He believed in the higher education of every citizen, because the educated worker can and does turn out more and better work than the uneducated worker. But he did not perceive how a commercial shop could be made a successful attachment or part of a technical school. The open market would be the final judge of excellence, so far as money earning qualifications are concerned. If all technical schools have commercial shops they must follow the course of all commercial enterprises—succeed or fail. All cannot succeed, and those that fail will bring the shop end of their educational system to an end. If the school shops were made State affairs it is difficult to see how they could dispose of their product, since they would not be permitted to manufacture in competition with the regular producer. "The trade unions would be after us." The speaker said:

"The American youth are wards of the nation. The State does not hesitate to provide the ways and means for the higher education of its youth till graduation from our high schools or free academies; and for this reason I do not see why the State should not supply, wherever possible, properly and thoroughly equipped school shops for its coming mechanics."

New Railroad Construction.

According to the *Railroad Gazette* over 4500 miles of new railroad track was built in 1899 in the United States. Thus the past year has witnessed much more activity in railroad building than any year since 1890, when the new mileage totaled 5670. Since 1893 not a year reached 3000 miles until 1898, when 3083 miles were built. The mileage of 1899 is therefore an important showing for the decade, although small in comparison with the annual increase made in the flush times of the eighties. The fact is pointed out that comparatively little building has been done the past year by new companies, more than three-quarters of the new mileage having been constructed by or in the interest of existing lines. The scene of greatest activity has been west of the Mississippi River, although large additions were made in the Southern, Northern and Middle Western States. Iowa built the most track. Minnesota came second and Arkansas third. The year, while showing marked progress in this respect, did not come up to expectations. It opened with numerous projects which seemed destined to be carried through. Owing to various obstacles, chief among them being the scarcity of labor and high prices and scarcity of materials, much work was postponed until more favorable conditions are found.

Considerable encouragement for the iron trade can be derived from the information thus gathered and presented. It is remarkable that the demand for all kinds of railroad material should have been so heavy in 1899, with so moderate a mileage of new track being laid. In the eighties the new mileage so constantly being built was largely the cause of the sustained activity in the iron trade. But not even in the years of greatest track

laying was there anything like the enormous tonnage of iron and steel required for railroad purposes that was ordered in 1899. That the railroads of the country have by no means satisfied their wants for the immediate future is shown by the immensity of the business for which they have made arrangements with iron and steel manufacturers for this year. In the background we still have an important group of expectant buyers, waiting for a more favorable opportunity to engage in the building of more railroads. Popular sentiment has undergone a change in respect to railroads, and so much hostility toward them is no longer manifested by law makers and law expounders. More prosperous times have softened men's hearts, and, with more money in their own pockets, they are more willing to see other interests thrive. It is therefore highly probable that with general conditions again ruling favorably toward railroad construction a larger mileage of new track will be constructed in the next few years. The country is by no means amply provided with railroads, even though some sections may be fairly well supplied.

So high an authority as E. A. Caswell confirms the general impression that the course of the American Smelting & Refining Company has been exceedingly judicious. Their attitude toward the mining interests of the Rocky Mountain region has been commended as fair. A committee of expert smelters has been steadily at work bringing all the plants to the highest efficiency by introducing improvements developed at individual plants. The commercial policy has been steadily directed toward the maintenance of a fair price for the metal and the suppression of distressing fluctuations. The rights and interests of different branches of the trade have been respected and recognized. Altogether, thus far, this one consolidation has shown a moderation which may well serve as an example to other recent organizations of this character in the metal trades.

Is Electricity Dutiable?

The United States Treasury Department has been called upon to render a decision on the question of electricity transmitted from the Dominion of Canada being dutiable. The ruling on the subject cannot fail to have a far reaching influence and the effect will be important in several places. Especially will it be important in connection with the development about Niagara Falls on both sides of the river. Considering the growing interest and success manifested and attained in the transmission of the electric current, it is not strange that it should become a border question and find its way into the Department in Washington for a ruling. It has been intimated that the subject was brought to the attention of the Department by the Niagara Falls Power Company, but Vice-President William B. Rankine has referred to such statement as being incorrect.

There is no doubt, however, that the development and prospective development in and about Niagara is what has brought the question into prominence, and it is more than possible that men who have or are about to become interested in certain Canadian projects have seen the wisdom of securing a ruling on the question of the propriety of a tariff on the current. In the daily press, the Ontario Power Company are mentioned also as being interested in the decision, but the fact is there is no such power company in the Dominion. There is, however, a Dominion Power Company, the name of which was formerly the Ontario Power Company, and the names may have been confused. This Dominion Power Company hold a charter from the Dominion Government to develop power on the Canadian side at Niagara by means of a canal. Heretofore the exclusive privilege enjoyed by the Canadian Niagara Power Company in Victoria Free Park, on the Canadian side, has delayed the company's progress, if they really wished to go ahead, from the fact that they could not get the privilege of discharging water into the lower Niagara through the park lands. But within a few months past the Canadian Niagara Power Company have relinquished all exclusive rights in the park, and if the Ontario Government and the Victoria Park Commission agree the company may get tailrace rights through the park lands.

This Dominion Power Company are disposed to be competitors for business with the Canadian Niagara Power Company. This latter company are backed by practically the same capital that the Niagara Falls Power Company have to make their work so successful. It is evident that the Canadian Niagara Power Company and the Niagara Falls Power Company would be and are two powerful allies, and the exchange of current from central stations might be of vast importance in case of accident to either station of the companies. If no duty was assessed on the current so transmitted it is probable that the exchange might be made with greater freedom and in greater volume than if a duty was assessed on the current transmitted. In any event, the operation of two great power plants such as the one built by the Niagara Falls Power Company and the one proposed by the Canadian Niagara Power Company as an aid to each other in time of need would be of great value to all industries located at Niagara, no matter on what side of the river.

The Niagara Falls Power Company have just completed a vitrified tile conduit from their power station to the upper steel arch bridge, and through this conduit and over the arch it is proposed to carry cables for the transmission of electric current from the big power house at the Falls, on the New York side, to the Canadian side. Until a few months ago the electric current service on the Canadian side was supplied through an installation of the Canadian Niagara Power Company in the station of the Niagara Falls Park & River Railway, but the destruction of this station by fire made connection with the power service on the New York side quite necessary, a fact that led to the construction of the conduit referred to, the cables in which are soon to be laid. The possibilities of development on the Canadian side favor a cheaper development and a development on more extensive lines than on the New York side, but in Canada there is not the demand for power that there is in the States. This fact has led to the hope that in time Buffalo would receive a power supply from the Canadian side. Should a duty be placed on the current, Buffalo would stand little show of being connected to the contemplated station. Many other points on the frontier will watch the decision of this question with a great deal of interest, but its importance is such that it undoubtedly will go to the highest courts before a definite result is obtained. There is good reason to believe that should the United States place a tariff on electricity Canada would not be long in following suit, as it is believed that the Dominion Government has already expressed the idea that the current should be taxed. Should the United States admit electricity free, other Governments might do the same. Where there is the greatest demand for any article, there is the greatest and most active market, but, considering all things at Niagara and the extensive development there by both the Niagara Falls Power Company and the Niagara Falls Hydraulic Power & Mfg. Company, there is little reason to conclude that the power development at Niagara Falls needs any protection from the proposed Canadian development, whereas the close business relations that must necessarily exist between the Niagara Falls Power Company and the Canadian Niagara Power Company, which probably will always be the greatest power concerns in the world, must of necessity be vastly beneficial to both sides of the river at Niagara and the industries now there and those to come.

The Indiana Natural Gas Field.

The State Geologist of Indiana, who has recently made a thorough investigation of the conditions throughout the natural gas belt, reiterates his belief that the supply of gas in Indiana can last but a short time and that the end of its usefulness for manufacturing purposes is practically in sight. The pressure he finds to be gradually and steadily decreasing. Since the field was opened, thirteen years ago, there have been a total of five thousand four hundred wells sunk. Of these, two thousand eight hundred have been exhausted, leaving only two thousand six hundred wells now producing, and the number is declining month by month. It is freely predicted that within two years the Indiana natural gas resources will be so diminished that it will be impossible to furnish many of the cities and towns now drawing upon the supply. The price of natural gas now is about double what it was ten years ago, and it is said that further advances are likely to be made. The effect of the failure of this valuable fuel upon the large manufacturing interests that have established themselves in the gas belt upon the strength of it would be serious in the extreme. The problem is engaging much attention just now, and the only solution so far suggested is the development of the coal resources of the State, which are believed to be extensive.

The Lake Ore Supply.

The Views of Leaders.

At the Head of Lake Superior.

DULUTH, December 30, 1899.—Two men who stand at the head of some the greatest mining and transportation interests of the Lake Superior region, when interviewed on the same question, particularly with reference to what the mines might do, and the factor of upper lake transportation did not care to be quoted but expressed these opinions:

"It is probable that the output from the different mines for 1899 did not reach their maximum in any except a very small percentage of cases. They were limited by the scarcity of labor, which was the overshadowing factor of the situation in all but the steam shovel mines, and as to these the output was limited by the physical character of their ores. It is a fact that, generally speaking, the steam shovel mines are of a class the limit to consumption from which is sharply drawn, not by what they might mine, but by what the furnaces are willing to receive. Mountain Iron, for instance, could as easily have sent forward 2,000,000 tons as it did its 1,140,000 tons. During the year there were no serious difficulties in the transportation of ores, the lakes were unusually favorable except for a late opening, and the blockades at the Sault, where the channels were stopped for some days, decreased shipments not a particle, for mines continued sending out ore without interruption. There was no trouble at receiving docks, no shortage of boats except in a few instances, and no shortage of cars. The labor problem was the one thing that contributed more than any other cause to put a definite limit to the output.

"With the men that can be had we can see no reason why the shipments of the coming year should not be in excess of those of 1899 by 2,000,000 tons, and with men as plenty as they have been in most past years, this excess will be easily made still more. These figures relate to the mines, and take no account of any interruption of navigation, blockades of Eastern roads or labor difficulties at lower lake receiving docks, and they will compel a steady and continuous shipment from upper lake docks of a fairly equable volume of tonnage all season through.

"Last year there was not sufficient coal received at the head of the lakes for the demands of trade, for the reason that Eastern roads could not get it to the lakes. With an increase in raw and manufactured goods in the new year, and with 2,000,000 tons additional in ore to be handled there is opportunity for serious railway blockades in the East, and of this we are not taking account.

"As to the roads from mines to lake, there will be no trouble in handling all of the excess probable. The Duluth & Iron Range road is to-day double tracking practically all of its main line from the docks to the Fayal mine, including the line to its junction point for Vermillion and Mesaba traffic; it is to receive 350 cars of 100,000 pounds capacity and sufficient locomotives, and it had no difficulty in handling a traffic the past year and without these new facilities of almost 4,000,000 tons. The Duluth, Missabe & Northern road is adding a dock of very large size, will have 500 30-ton cars, and sufficient motive power, is double tracking some of its line, and will have facilities for moving nearly 5,500,000 tons in 1900. The Eastern Minnesota is adding a very large dock, will have 400 100,000-pound cars and ample motive power, and expects to move more than 1,600,000 tons in 1900.

"More new ore has been found on the Mesaba range alone the past year than Lake Superior has shipped in the year. This is new ore, for while in a general way there has been a hazy knowledge of the existence of deposits where most of it is located, the former knowledge of a few hundred thousand tons cannot be claimed to prove that millions opened there subsequently were known. What the Mesaba may show in the way of new ore in the future is a delicate question, however, in view of what has been done there in the past. We look on the Menominee as a favorable region for discoveries.

"Eight years ago it was claimed that all the big deposits of the Mesaba had been found. They then were the Biwabik, Missabe Mountain, Mountain Iron, Mahoning. A little ore had been found at Canton, Genoa, Adams, Franklin, Commodore, a little at Hibbing and some at Sparta. Look at the big deposits now. Mountain Iron and Mahoning have been enlarged, materially, Fayal, one of the biggest of them all, was not known then, Sauntry has been found, the Hibbing group developed, and of yet unopened mines Virginia has been explored and shown to be great, and Roucheleau is known. Ore bodies of from 5,000,000 and 6,000,000 to 10,000,000 tons have been found, but we don't call them big to-day. For 10 miles northeasterly from Hibbing there is ore that was only known of fractionally a year ago.

"Labor will be costly, and with the advance in ore prices may go to a higher point than now."

Joseph Sellwood's Views.

Joseph Sellwood, general superintendent of the American Mining Company, is a man well known in the ore trade of the United States, and is one of the strongest thinkers and most successful operators to be found in the Lake Superior district. Interviewed this week on the conditions affecting the market the past year, and the prospects for the future, Mr. Sellwood said:

"One of the chief facts of the past year has been the growth of the movement looking to the control of ore supplies by consumers. If one calls the Carnegie Company, the Federal, American Steel & Wire, National, Republic and Cambria the leading concerns using lake ores, then they all are now covered, to a more or less extent, by their own ores. So thoroughly based on common sense is this movement that I believe it will not cease as long as there is any ore to be had. Because of the fact that there has been more ore to be had in the Mesaba than on other ranges, the movement for ores has been more emphasized on that range than any other. As a natural consequence, and induced also by the relative prices, Mesaba shipments the past year have been a greater proportion of the whole by about 5 per cent. than the year before. In 1895 that range shipped about 26 per cent. of the total tonnage of Lake Superior, this year it is likely to be not under 40 per cent. of the whole. Now Mesaba ores are selling for next year at about 70 cents under the price of corresponding old range ores, though were the differentials to remain in proportion to the advance in prices there should be $1 difference against that range. The differential is growing less, and it will ultimately disappear."

"The question, then, of the proportion of Mesaba ores is one of price, providing old ranges are able to furnish what is called for from them?"

"It is so with all ores. Take such ores as Norrie and the adjoining Ashland, for instance. No one would buy Norrie at $5.50 if he could get Ashland in quantity at $5. It is the same with Mesaba as compared with old ranges; it may take a little more fuel to make the same amount of iron from Mesaba ore, and a little more loss on account of fineness of the ore, but if the ore is supplied enough cheaper to make up the loss it will grow steadily in proportionate consumption. I do not think it need be demonstrated now that a much larger portion of the furnace burden can be of Mesaba than was supposed a short time ago. To some extent these things are the result of the year, and they are important.

"Another thing, there has been a wonderful amount of exploration and development the past year; and what has it shown? There are to-day more ores in sight than ever before, but with this qualification—that we are including such ores as we did not figure on a few years ago. The high grade Bessemer ores of the old ranges are getting scarce, and they are taking to-day lean Bessemers, high phosphorus ores, and in this way are bringing to bear an enormous tonnage that was not counted. There is a very large amount of ore in Marquette County, for instance, that runs better than 40 per cent. iron and low in phosphorus, and that is now valuable. Then the neglected high phosphorus ores of the Menominee are now in demand. There is only one new mine shown on the Gogebic this year, the New Davis, and it is not what it might be. Drill after drill has been worked on the Vermillion this year, but there are no deposits shown that were not known in 1886. Of course here, as everywhere else, the limits of ore bodies have been extended and the tonnage in sight greatly magnified by thorough sarch, but of new bodies found there are few. On the Mesaba, for example, a great volume of what might be called new ore is now passing into the hands of big companies, but it is ore that has been known of to some extent for years; most of it was found in 1892 and 1893, and dropped out of sight then because of temporary conditions. The ore now being opened into on the Menominee is mostly in old mines that were abandoned years ago, but that new conditions have brought into play again.

"However, there is far more ore on these ranges than most people think, and I do not suppose it has all been found yet by any means. I recollect that in 1894, I think it was, predictions were made by experts after careful examination that there were not to exceed 10,000,000 tons on the Gogebic range. Since then the range has shipped considerably more than that and I doubt if any one would to-day predict that it is within 10,000,000 tons of exhaustion. As to these predictions I remember Brotherton; the beginning of the season that it shipped 130,000 tons a well-known expert figured there were not 50,000 tons all told, in the mine. This question of the exhaustion of the mines is like that of the exhaustion of the pine forests—it'll come some day, but in the

meantime they hold out to the confounding of the prophets. In 1894 they had reached the bottom at the Norrie, the Ashland, the Aurora and others, and had them all measured up as they thought, but they since have gone through that bottom and found more ore beneath. In the early days of the Marquette nobody would have prophesied that the range could last till to-day even with the small shipments of those days, but it is increasing year after year. There is more ore in sight on that range than at any time in its history, due largely to the conditions I have referred to—the use of what was considered valueless material. Original mines have been worked out and abandoned, but they have found deposits close by, and are now working within a half mile of the original developments of the first Marquette County mines. At the Cleveland, for instance, most of the ore is now coming from the Lake shaft, where 15 years ago there was nothing. Then it was the Sellwood pit and the incline. Now these are worked out.

"Mostly all the hard ores of the Marquette are gone. It still comes out of the Cliffs shaft, the Republic and Champion, and a little from the Lake Superior, but in most cases they have opened other deposits on their own lands and are now mining soft ore.

"While the mines shipped largely the past year and made a big hole in the deposits it does not mean that they'll not do more another season, but 20,000,000 tons a year, or more, will some time make things look pretty lean. I look for no serious financial trouble this year, and if there is none we'll get out a big pile of ore, 20,000,000 tons probably. The mines can do it easily enough. Every range can increase, and Minnesota cannot only mine half of that, but her railroads can handle it. As for Michigan, her roads have practically handled 10,000,000 tons the past year, and with the all-rail shipments of the winter will probably have actually less ore to handle in the coming season of navigation, to make a season total of 10,000,000 tons, than they did last season. As for the Minnesota ranges, it is conservative to put the Mesaba at 8,000,000 tons and reasonable to expect 2,000,000 from the Vermillion. The Gogebic to equal its record of 1892 need only add 240,000 tons, and it is quite likely that a single mine, perhaps Atlantic, for instance, is prepared to increase over the past year a good part of that; Menominee range ought to get to 3,500,000 tons, the increase coming from the non-Bessemers around Iron River and Crystal Falls; and Marquette is safe at 3,750,000 tons, which is only a slight increase over last year."

At Cleveland.

The chief topic of discussion in iron ore circles during the past week has been the output of the Lake Superior ore region during the year just closed, as exemplified by the figures reported by dock managers at all shipping ports to the offices of the operating companies in this city. These statistics constitute the first thoroughly authentic presentation of the year's production which has been made, and although it became evident as much as a month and a half ago that the total output would exceed 18,000,000 tons, the evidence that with rail shipments the total movement during the year exceeds 18,500,000 tons came as a surprise to many persons tolerably conversant with the situation. The iron ore statistics, as soon as they are compiled each year, are made the basis for a deal of estimating and speculation regarding the prospects for the new season, and this has been true in an unusual degree this year. It may be attributed in some degree to the fact that the report just made is characterized by a number of significant conditions. For instance, of the increase of something like 4,500,000 tons over the movement in 1898 fully 2,500,000 tons are to be credited to the new ranges—the Mesaba and Vermillion. Several of the best informed men among the iron ore producers have expressed themselves to the corespondent of *The Iron Age* regarding the conclusions to be drawn from the showing of the past season and the influence of the newly created conditions upon the future.

W. G. Mather, president and treasurer of the Cleveland-Cliffs Iron Company said: "The production of the sason just closed was unquestionably of course something of a surprise, but that it was due to a considerable extent to the length of the season is also apparent. The increase has been, of course, largely in the output of the Mesaba mines, which can the more readily respond to the pressure of increased demand because of their utilization of steam shovels. The other mines proved themselves inadequate to greatly increase their output. I am inclined to believe that we shall next season get out considerably more ore than during the year just closed. With nothing unforeseen intervening I should be inclined to predict that the output for 1900 would be between 19,000,000 and 20,000,000 tons. That there will be a demand for considerably more ore--say, from 20,000,000 to 21,000,000 tons—must be apparent from a moment's consideration of the question. In the first place during only a portion of the past year were there as many furnaces in operation as at the present time. On the other hand, the fact that even with a total production of 18,500,000 tons the demands of the past year from December to December have been little more than met is evidenced by the fact that there is on dock at the present time little more ore than was on dock at the corresponding date a year ago. Looking ahead I cannot see any single factor which is likely to retard increased production next year. All the mines which are located near towns have, I think, just about all the men needed to operate them. Some of the mines in the woods may experience some shortage in the labor supply, but I can hardly believe that it will be serious. The railroads from mines to shipping ports on the upper lakes will with their additional equipment meet, I am confident, all demands, and the additional facilities in the way of docks will also prove adequate. Of course the supply of lake tonnage will be ample. Regarding the supply of cars for the transportation of the ore from unloading ports to furnaces I am not so well informed, but if there is any link in the transportation chain which is capable of improvement this is probably the one. To sum up the situation, I should say that facilities all along the line will be taxed next season, and certainly there will be no more ore produced than is needed, but I am inclined to believe that the output will be sufficient to meet demands."

D. B. Chambers, secretary of the Stewart Iron Company: "I believe that we shall produce at least as much ore next season as during the one just closed. Whether the aggregate production will be increased will depend largely upon the Mesaba range. As to what the other properties will do it is almost impossible to predict. Some of the mines will not do so much as during 1899, while others will probably do more; finally there are new mines to be reckoned with. The heavy production during the past year may have been due partly to the length of the season, but I am inclined to think that it should be attributed chiefly to the pressure applied at every point. The magnitude of the output has done one thing, and that is, demonstrated the capability of the ore carrying roads of the Lake Superior district and the ore docks at upper lake ports. When it is remembered that their facilities are to be still further increased next season, it will be seen, I think, that there need be no uneasiness on this score. There was at no time during the past year any scarcity of general labor at the mines. It was underground workers who were lacking. Many of these were attracted to the copper regions during the excitement, but a majority of these men will, I think, drift back to the iron mines. Finally there is no doubt but that there will be plenty of ships to move all the ore mined. The higher rates are likely to bring into the ore trade a number of vessels which have heretofore been engaged in the transportation of other commodities and considerable new tonnage will go into commission in the spring."

Said W. B. Castle, secretary of the Republic Iron Company: "I think that the remarkable showing made during the season of 1899 may be attributed almost solely to the existence of a demand for the raw material. When a demand as great as was that in the iron trade during the past year exists, it can usually be depended upon to be met in some manner. I am inclined to believe that the production for 1900 will reach the 20,000,000-ton mark. There will certainly be plenty of boats to move all the ore that can be mined, and I am confident that some solution will be found for the scarcity of labor should that prove a problem. It is well to remember that even with the short supply of labor in the mines during the past season the production reached 18,500,000 tons. The greater part of the increase next season will have to come, of course, from the Mesaba range, but with each of the older properties showing only a slight increase the aggregate excess over the total for 1899 will be considerable."

L. C. Hanna said: "In my opinion the heavy production during the season just closed was due largely to the length of the season combined with the fact that all the best talent we have in every branch of the business exerted itself to the utmost to get out every pound of ore which could possibly be produced, feeling sure that it would all be needed. When you turn loose all the ability to be found from one end of the Lake Superior region to the other something is bound to be accomplished. As for next season I think that the prediction of a production of 20,000,000 tons is full strong. Many of the mines on the old ranges reached their maximum output last season, no matter what labor supply is available. Probably, however, the ore which will come into the market from the old properties which are being reopened will make up for the falling off in the case of some of the other mines which are on the decline, and thus, on the whole, the old ranges ought to show perhaps a slight increase next year. On the Mesaba I believe that it will be possible to get out all the ore which the transportation facilities into and out of the district will be capable of handling. To sum it up, therefore, I would say that should no unforeseen serious obstacles

intervene the total production for the present year might be placed at 18,000,000 tons as a minimum and at perhaps close to 20,000,000 tons as a maximum. The scarcity of labor in the mining district is likely, I should say, to prove the most serious of the problems at present in sight." D. E. W.

American Exhibitors at Paris.

The following list contains the names of the principal persons, firms or corporations in the iron, hardware, machinery and metal branches who have accepted the space assigned to them by the Commissioner-General.

Abbey & Imbrie, New York City.
Acme Machinery Company, The, Cleveland, Ohio.
Aeolipyle Company, New York City.
Aermotor Company, The, Chicago.
American Bicycle Company, New York City.
American Clay Working Machine, Bucyrus, Ohio.
American Encaustic Tile Company, New York City.
American Fire Engine Company, Seneca Falls, N. Y.
American Hard Rubber Company, Akron, Ohio.
American Iron & Steel Mfg. Company, Reading, Pa.
American Machinery Company, Grand Rapids, Mich.
American Motor Company, New York City.
American Radiator Company, Boston, Mass.
American Shearer Mfg. Company, Nashua, N. H.
American Steel & Wire Company, New York City.
American Steel Hoop Company, Pittsburgh, Pa.
American Tin Plate Company, Chicago.
American Tool & Machinery Company, Boston, Mass.
American Turret Lathe Company, Wilmington, Del.
American Wringer Company, New York City.
Armstrong Brothers Tool Company, Chicago.
Ashton Valve Company, Boston, Mass.
Atkins, E. C., & Co., Indianapolis, Ind.
Atlas Tack Company, Taunton, Mass.
Aultman, Miller & Co., Akron, Ohio.
Baird, Henry Carey, & Co., Philadelphia, Pa.
Ball Engine Company, Erie, Pa.
Bates Machine Company, The, New York City.
Becker-Brainard Milling Machine Company, Hyde Park, Mass.
Becker, John, Fitchburg, Mass.
Bickford Drill & Tool Company, Waukesha, Wis.
Bicycle Step Ladder Company, Chicago.
Bissell Carpet Sweeper Company, Grand Rapids, Mich.
Bommer Brothers, Brooklyn, N. Y.
Bradford Mill Company, Cincinnati, Ohio.
Brashear, John A., Allegheny City, Pa.
Bristol Company, The, Waterbury, Conn.
Brown & Paterson, Brooklyn, N. Y.
Brown & Sharpe Mfg. Company, Providence, R. I.
Buhl Stamping Company, Detroit, Mich.
Bullard Machine Tool Company, Bridgeport, Conn.
Bullock Electric Mfg. Company, The, Cincinnati, Ohio.
Bullock, M. C., Mfg. Company, Chicago.
Burr, John T., & Son, Brooklyn, N. Y.
Cardwell Machine Company, Richmond, Va.
C. & C. Electric Company, Garwood, N. J.
Chicago Brass Company, Chicago.
Chicago Flexible Shaft Company, Chicago.
Chicago Handle Bar Company, Chicago.
Christensen Engineering Company, Milwaukee, Wis.
Cleveland Axle Mfg. Company, Canton, Ohio.
Cleveland Machine Screw Company, Cleveland, Ohio.
Colorado Fuel & Iron Company, Denver, Col.
Columbia Automobile Company, Hartford, Conn.
Columbia Cordage Company, Auburn, N. Y.
Consolidated Rubber Tire Company, New York City.
Crane Company, Chicago.
Crescent Steel Company, Pittsburgh, Pa.
Crocker-Wheeler Electric Company, New York, N. Y.
Curtis & Curtis, Bridgeport, Conn.
D'Armour & Littledale, New York City.
Detroit Lubricator Company, Detroit, Mich.
Devlin Thomas & Co., Philadelphia, Pa.
Eagle Lock Company, Terryville, Conn.
Enterprise Mfg. Company, Philadelphia, Pa.
Fairbanks Morse & Co., Chicago.
Fauber, W. H., Chicago.
Fay, J. A., & Egan Company, Cincinnati, Ohio.
Fellows Gear Shaper Company, Springfield, Vt.
Fenwick, A. D., Machine Company, Boston, Mass.
Ferracute Machine Company, Bridgeton, N. J.
Flather & Co., Nashua, N. H.
Flather Planer Company, The, Nashua, N. H.
Fraser & Chalmers, Chicago.
Forbes, W. D. & Co., Hoboken, N. J.
General Electric Company, Schenectady, N. Y.
Gesterlein Machine Company, The, Cincinnati, Ohio.
Gisholt Machine Company, Madison, Wis.
Gorton, George, Machine Company, Racine, Wis.
Gould Coupler Company, New York City.
Grant Machine Tool Works, The, Cleveland, Ohio.
Hartshorn, Stewart, Company, East Newark, N. J.
Hendey Machine Company, The, Torrington, Conn.
Horton, The E., & Son Company, Windsor Locks, Conn.
Indiana Bicycle Company, Indianapolis, Ind.
Ingersoll, Robt. H., & Bros., New York City.
Ingersoll-Sergeant Drill Company, New York City.
Inman American Box Machine Company, Amsterdam, N. Y.
Irwin Auger Bit Company, Wilmington, Ohio.
Jeffery Mfg. Company, Columbus, Ohio.
Jones & Lamson Machine Company, Springfield, Vt.
Kearney & Foot Company, New York City.
Knauer, E., New York, N. Y.
Lamb, J. & R., New York, N. Y.
Latham Machine Company, Chicago, Ill.
Lee Injector Mfg. Company, The, Detroit, Mich.
Link-Belt Machinery Company, The, Chicago.
Liquid Air Refrigeration & Power Company, Boston.
Locomobile Company of America, New York, N. Y.
Lorain Steel Company, Lorain, Ohio.
Lozier Mfg. Company, Cleveland, Ohio.
Ludlow Valve Mfg. Company, The, Troy, N. Y.
Manhattan Brass Company, New York, N. Y.
Markt & Co., New York, N. Y.
McConway & Torley Company, Pittsburgh, Pa.
McCormick Harvesting Machine Company, Chicago.
McGee Furnace Company, Boston, Mass.
McKee, Fuller & Co., Catasauqua, Pa.
Mead Cycle Company, Chicago.
Meadville Vise Company, Meadville, Pa.
Metallic Flexible Tubing Company, Philadelphia.
Michigan Stove Works, Detroit, Mich.
Milwaukee Harvester Company, Milwaukee, Wis.
Morgan Machine Company, Rochester, N. Y.
Morris, J. B., Foundry Company, Cincinnati, Ohio.
Morse Twist Drill & Machine Company, New Bedford, Mass.
Mott, J. L., Iron Works, New York, N. Y.
Muzzy Brothers, Paterson, N. J.
National Cash Register Company, The, Dayton, Ohio.
National Specialty Company, The, Racine, Wis.
New York Belting & Packing Company, New York, N. Y.
New York Blower Company, New York, N. Y.
North Bros. Mfg. Company, Philadelphia, Pa.
Norton Emery Wheel Company, Worcester, Mass.
Ohio Tool Company, Auburn, N. Y.
Oil Well Supply Company, Pittsburgh, Pa.
Olson, Tinius & Co., Philadelphia.
Oneida Community, Niagara Falls, N. Y.
Osborne, D. M., & Co., Auburn, N. Y.
Oster Mfg. Company, The, Cleveland, Ohio.
Otis Elevator Company, New York, N. Y.
Overman Wheel Company, Chicopee Falls, Mass.
Pearson Machine Company, Chicago.
Peck & Snyder, New York, N. Y.
Pencoyd Iron Works, Philadelphia, Pa.
Phœnix Horse Shoe Company, Poughkeepsie, N. Y.
Pike Mfg. Company, Pike Station, N. H.
Plumb, Fayette R., Philadelphia, Pa.
Plymouth Cordage Company, Plymouth, Mass.
Powell, William, Company, The, Cincinnati, Ohio.
Pratt & Whitney Company, The, Hartford, Conn.
Prentice Brothers Company, Worcester, Mass.
Pressed Steel Car Company, Pittsburgh, Pa.
Prindle Pump Co., New York, N. Y.
"Q. & C." Company, Chicago.
Rand Drill Company, New York City.
Rice Gear Company, Hartford, Conn.
Richmond Locomotive Works, Richmond, Va.
Rider-Ericsson Engine Company, New York City.
Robins Conveying Belt Company, New York City.
Rochester Radiator Company, Rochester, N. Y.
Roebling's John A., Sons & Co., Trenton, N. J.
Russia Cement Company, Gloucester, Mass.
St. Louis Well Machine & Tool Company, St. Louis, Mo.
Savage Arms Company, Utica, N. Y.
Schieren, C. A., & Co., New York City.
Shaw Electric Crane Company, The, Muskegon, Mich.
Shelton Company, The, New York City.
Sherwood Mfg. Company, Buffalo, N. Y.
Shriver, T., & Co., New York City.
Simonds Mfg. Company, Fitchburg, Mass.
Smith & Wesson, Springfield, Mass.
Smith, N. B., Machine Company, Smithville, Burlington County, N. J.
Spalding St. Lawrence Boat Company, Ogdensburg, N. Y.
Spalding, A. G., Brothers, New York City.
Standard Caster & Wheel Company, New York City.
Standard Mfg. Company, Pittsburgh, Pa.
Standard Pneumatic Tool Company, Chicago.
Standard Steel Works, Philadelphia, Pa.
Standard Tool Company, Cleveland, Ohio.
Stanley Rule & Level Company, New Britain, Conn.
Stanley Works, The, New Britain, Conn.
Sterling Cycle Works, Kenosha, Wis.
Stiles & Parker Press Company, The, Brooklyn, N. Y.
Stillwell-Bierce & Smith Vaile Company, Dayton, Ohio.
Stirling-Firth Company, Pittsburgh, Pa.
Stover, Mfg. Company, Freeport, Ill.
Tabor Mfg. Company, The, Elizabeth, N. J.
T. & B. Tool Company, New Bedford, Mass.
Taunton Locomotive Mfg. Company, Taunton, Mass.
Taylor Iron Company, New York City.
Thomson, John, Press Company, New York City.
Travers Brothers Company, New York City.
Troy Nickel Works, Albany, N. Y.
Tuttle & Bailey Mfg. Company, New York City.
Tyler, W. S., Company, The, Cleveland, Ohio.
Veeder Mfg. Company, Hartford, Conn.
Vermont Farm Machine Company, The, Bellows Falls, Vt.
Virginia Iron, Coal & Coke Company, Bristol, Tenn.
Walworth Mfg. Company, Boston, Mass.
Warder, Bushnell & Glessner Company, Chicago.
Warner & Swasey, Cleveland, Ohio.
Warren Webster & Company, Camden, N. J.
Westcott Chuck Company, Oneida, N. Y.
Westinghouse Electric & Mfg. Company, The, Pittsburgh, Pa.
Wheeler Condenser & Engineering Company, New York City.
Whitman & Barnes Company, The, Akron, Ohio.
Winslow Brothers Company, Chicago.
Wood, Walter A., Mowing & Reaping Machine Company, Hoosic Falls, N. Y.

Withington & Cooley Mfg. Company, Jackson, Mich.
Worthington Pumping Engine Company, New York City.

The David Williams Company, New York, publishers of *The Iron Age*, will exhibit a Library of Commercial Literature, to which we make editorial reference.

Settling the Chicago Building Trades Dispute.

The joint conference committee of the Chicago Building Contractors' Council and the Chicago Building Trades' Council came to a definite agreement on Saturday last. The agreement is to be ratified by the bodies respectively represented before going into effect, but little doubt is expressed that the ratification will be speedily accomplished. The text of this agreement is as follows:

SECTION 1. Each council shall elect a board of arbitration of five members, who shall jointly constitute a final board of arbitration, to serve until their successors are elected, and who shall have the power to impose such fines or punishments or both as in their judgment the evidence may warrant, and until such fines shall have been paid or punishment satisfied such member or members shall be barred from all the privileges of the council, association or union to which he or they may belong.

SEC. 2. The right of a steward on the job to protect the journeymen's interest is recognized. All complaints, disputes or violation of joint agreements by employer or employee, parties to this agreement, to be adjusted by the contractor or his agent and the steward or business agent of the Building Trades' Council or affiliated unions, who shall be allowed to visit all jobs during working hours to interview the steward or workmen, but will not in any way interfere with their work. Failure to adjust any complaints, disputes or violations of agreement, the subject matter shall at once be referred to the standing arbitration committee of five from the employers and five from the employees representing the trades interested, who shall immediately decide the matter at issue. Any case at issue that cannot be adjusted by the trade directly interested, appeal shall immediately be taken to the final board of arbitration, as provided in section 1, to adjust all matters referred to it by any of the associations affiliated or may become affiliated with either party to this agreement, and that their decision shall be final. Said final board of arbitration shall be and is hereby given full power by both parties to this agreement to establish and enforce its own rules of procedure. No strike or lockout shall be authorized or called by either party to this agreement or by any member or association affiliated or may become affiliated with either party or their business agents, by reason of any dispute arising between the unions represented in either association. Work shall continue uninterrupted while any case is pending before the final board of arbitration.

SEC. 3. There shall be no limitation as to the amount of work a man shall perform during his working day.

SEC. 4. The question of machinery is hereby referred to the different organizations of employers and employees. In the event of failure to agree, either party shall have the right of appeal to the final board of arbitration.

SEC. 5. That each established employer in each respective trade shall be allowed to have at least one apprentice, whose time of expiration of apprenticeship shall expire before the apprentice shall reach the age of 22 years.

SEC. 6. No restrictions shall be placed on the use of building materials other than cut and sawed stone, granite, exterior marble work, common brick, wood mill work (except mantels and movable furniture), and prison-made material.

SEC. 7. It shall remain optional with the contractor as to the amount of men he shall employ.

SEC. 8. No rules other than those embodied in this agreement shall be promulgated, recognized or enforced by either party to this agreement, their affiliated associations or their members while the same remains in force, unless authorized by the final board of arbitration.

SEC. 9. The respective associations connected with the two councils shall immediately upon the adoption of this agreement by the two councils call together their arbitration committees to formulate such necessary rules and joint agreements as they may deem fit to govern their respective trades in the future, and submit the same without delay to the final board of arbitration for approval or otherwise.

SEC. 10. Members of the employers' associations represented in the Building Contractors' Council shall in all ways receive as favorable treatment by the Building Trades' Council and its affiliated unions as do any contractors in the same trade who are not members of associations affiliated with the Building Contractors' Council.

SEC. 11. It is agreed that as long as this contract is faithfully kept by the Building Trades' Council and its affiliated unions the members of the associations affiliated with the Building Contractors' Council in the erection of buildings will employ at the buildings in Cook County none but the workmen carrying Building Trades' Council working cards in good standing in their respective callings, except where it may be otherwise agreed, now or in the future, by the joint arbitration committee of the trade involved.

With this agreement in force, as it undoubtedly shortly will be, many of the obnoxious regulations of the past will be wiped out. Labor disputes are to be settled immediately by the arbitration board and not to be long drawn out. Limitations on what a man shall do in a working day are abolished. The walking delegate is retained, but his powers are curtailed. The workingmen have gained a strong point in binding the contractors to assist them in completely unionizing the city building trades.

OBITUARY.

CHARLES P. KRAUTH.

Charles Philip Krauth, secretary of the McConway-Torley Company, foundrymen, of Pittsburgh, died in that city on December 27, aged 50 years. He was born in Philadelphia and graduated from the University of Pennsylvania. After completing his college course he spent eight years in Germany, where he studied mining engineering. For some time Mr. Krauth was head of a department of the Pullman Palace Car Company, but for some years past he had been connected with the McConway-Torley Company.

AMOS B. HEYWOOD.

Amos Bardwell Heywood, for many years secretary and treasurer of the Humphrey Machine Company, Keene, N. H., died December 25, aged 75 years.

NATHANIEL R. BENSON.

Nathaniel R. Benson died suddenly on December 31 at his home in Wilmington, Del., aged 42 years. After graduating from the University of Pennsylvania Mr. Benson entered the employ of the Harlan & Hollingsworth Company of Wilmington, in which he held various positions, being superintendent of shipbuilding for a number of years. He held that position until two years ago, when he retired from the company. Mr. Benson succeeded to his father's interest in the Harlan & Hollingsworth Company and was a director of the company for several years.

ROBERT PEMBERTON.

Robert Pemberton, formerly with the National Machinery Company of Tiffin, Ohio, and later manager of the Fowler Bolt Works, Anderson, Ind., died very suddenly of heart failure in Glasgow on December 3. Mr. Pemberton was born in Warrington, England, in 1850 and resided in the United States from 1887 to 1895. At the time of his death he was manager for James Miller & Co., Limited, Stobcross Rivet, Bolt & Nut Works, Coatbridge, Scotland.

S. T. P. MARTIN.

S. T. P. Martin, a director of the Dana Hardware Company, Boston, Mass., and for over 30 years connected with that concern, died of pneumonia at his home in Brighton on Saturday morning, December 30, and was buried on Monday, January 1. A special meeting of the New England Iron and Hardware Association was held at their rooms in the Mason Building, Boston, on the morning of January 1 to take action on his death, and it was voted to attend the funeral and to send a floral tribute. Mr. Martin was closely identified with the hardware interests of New England.

Feat in Elevated Railroad Building.

A race against time has just been won in the completion of the Northwestern Elevated Railroad in Chicago. The company received a franchise from the city permitting the construction of the road and providing that it should be completed by December 31, 1899. They began the work in 1894, encountered financial difficulties which compelled its suspension until about a year since, and then encountered great difficulties in getting deliveries of steel from the mills. A considerable part of the structure still being uncompleted early in December, the company applied to the city authorities for an extension of time. Greater compensation was asked than for the original franchise, and the company besides had a deposit of $100,000 in the city treasury which was liable to forfeiture. With but a little over two weeks of time left, the management of the company went vigorously to work to complete the road. Fortunately all the foundations for columns were in place, having been finished long since. In the rush to get steel and other material, trains so loaded have taken precedence over passenger trains on the Erie, Grand Trunk and Baltimore & Ohio railroads. But it was all delivered in time to enable workmen employed in eight-hour shifts, three shifts a day, to erect the structure for a mile or more of double track and equip it for the passage of trains. They suffered great hardships, the weather being bitterly cold, for days the temperature hovering about zero, but by their endurance the company won the fight. The first train passed over it on the 30th. The road is 7½ miles long and for 6 miles has four tracks to enable both express and local trains to be run. It is very substantially built, even the part so hastily erected being in no way inferior. This completes the Chicago scheme of elevated railroads, every section of the city now having a road connecting with the loop encircling the business center.

Trade Publications.

Air and Gas Compressors and Rock Drills.—We have received two catalogues from the Rand Drill Company of 100 Broadway, New York, describing their air and gas compressors and rock drills. The many years' experience of this company enables them to place upon the market a line of compressors adapted for all kinds of work and ranging from the smallest belt compressors to the cross compound Corliss compressor producing 1 horse power on less than 2 pounds of coal per hour. The sources of loss in power have been studied and close attention has been given to details of construction, so that their compressor of to-day combines durability, efficiency and neatness of design. This company were the first to adopt the duplex engine as the power end of their air compressor, because they were the first to be convinced that its construction met the peculiar requirements of air compressing work better than any other design. In compressing air by means of a reciprocating steam engine the resistance due to compression is inversely proportioned to the power in the steam for the same part of the stroke—namely, at the beginning of compression the pressure is greatest in the steam cylinder and diminishes as the stroke advances, due to expansion of the steam, while the air pressure increases, due to compression. The duplex type offers the best solution for equalizing the resistance and power. The respective pistons on one side are adapted to move relatively to the pistons on the other side, so that when one piston is at the beginning of its stroke the other is at the middle of the stroke, whereby the resistance of the air to both pistons is practically equalized throughout the entire stroke. This catalogue contains many excellent half-tone views of the different types of air compressors, all of which are direct reproductions from photographs of machines designed and actually built by the company. The rock drills belong to the class known as striking or reciprocating drills worked by steam or compressed air, in which the drill steel is an extension of the piston rod. The cylinder slides in a shell or guide which is in turn mounted upon a tripod, column or shaft bar according to the work to be done. The cylinder is fed toward the rock as fast as the steel penetrates it. The requirements for a perfect rock drill are numerous, but it should first of all be simple in construction and strong in every part. It should occupy but little space and should be light in weight for easy handling. It should also be economical in its use of the driving fluid and should put down a hole in the shortest possible time. All of these essential features are fully embodied in the Rand drills.

Down Draft Forges.—A pamphlet of the Buffalo Forge Company of Buffalo, N. Y., describes their down draft forges, the demand for which at the present time is so great that this deparment of their works is taxed to its utmost to keep pace with orders. The pamphlet illustrates a number of new types which have recently been designed and brought out to meet special requirements. One is intended for carriage, wagon and training schools, smith shops, and for moderate work is perhaps better than any other type. Their O. D. is the heaviest and largest forge built. It is constructed entirely of cast iron and is intended for the heaviest work ever performed in a blacksmith's shop. Their down draft stationary blast heating forge removes all the injurious fumes from coal, coke and furnace fires. While the Buffalo down draft system was not applied to the heating system at as early a date as to the forges it has proven so highly efficient that the company are meeting a demand unprecedented for these applications. This down draft system is a new departure in smoke removal. The smoke and gases are drawn away immediately on being generated. There is no escape from the largest and heaviest fires. This is done by down draft suction through underground tile pipes. There are no overhead piping systems and inefficient telescope hoods obstructing light and valuable space. The forge shop atmosphere is as pure as the best ventilated machine room and the temperature materially reduced in summer.

Finished Castings.—A pamphlet of the H. H. Franklin Mfg. Company of Syracuse, N. Y., presents illustrations of many intricate specimens of their finished castings. These castings take the place of brass or iron for many purposes and are hard and strong. The pattern can be reproduced so accurately as not to require any subsequent machining. The company now have a capacity of 450,000 pieces of all kinds and sizes per month.

Steam Engines.—The Chandler & Taylor Company of Indianapolis, Ind., in their Series N catalogue describe their high class tandem compound engines. This company were among the first to adopt the Rites system of governing, using the inertia governor, and are now the first to employ the Rites method of steam distribution for horizontal compound engines. This system accomplishes every object for which a compound engine has been used in the past, and it also opens up a new field. Varying loads and non-condensing conditions have heretofore not been favorable for engines of this class, but with the new method of steam distribution high economy can be obtained over the whole range of power when working the engine either noncondensing or condensing. The general design and the proportion of parts of these engines are the results of an experience of over 40 years in engine manufacture.

Grinding and Polishing Machines.—Perry Ransom of Oshkosh, Wis., has prepared a pamphlet dealing with the Vulcan grinding and polishing machinery. His No. 4 grinder with belt strapping attachment will be appreciated by bicycle manufacturers, who will see the advantage of this machine over the old style of strapper with floor support. One of the pulleys carrying the strapping belt is mounted upon the shaft of the grinder, while the outer pulley is carried upon an arm projecting from the table of the grinder. This construction permits the bicycle frame to be slipped over the belt and finished on the inside. There being no floor support for the outer pulley of the belt the operator can slip the frame over the small pulley and tip it in any direction on the belt. The attachment is suitable for work on frames, forks or any other irregular shapes. The belt is quickly removed and can be tightened to any required tension by a screw.

Emery and Corundum Wheels.—A catalogue received from the Vitrified Wheel Company of Pittsfield, Mass., deals with their emery and corundum wheels, grinding machines, emery wheel dressers, &c. These wheels are made in almost every conceivable shape and size, and are adapted for every service demanding the employment of an abrading material. The company carry a full line of emery sticks and pencils, which are fast finding their way into work which was formerly done with a file or hand chisel. They also carry in stock at all times a full line of rubs used in foundries and stove works, also for knife sharpening, sharpening wood carving and all hand tools, carpenters' chisels and other edged tools.

Electric Controllers.—A circular of the Electric Controller & Supply Company of Cleveland, Ohio, describes their single controller for 5 to 30 horse power and their double controller for 35 to 60 horse-power. These devices are for reversing and controlling the speed of electric motors for any purposes where the motors are to be constantly controlled by hand as to speed and direction.

Scales, Hay Presses, Cooperage Machinery, Shafting, Pulleys, &c.—The H. N. Strait Mfg. Company, Kansas City, Kan., have issued a large catalogue dealing with their wide lines of standard scales, hay presses, cooperage machinery of all kinds, couplings, hangers, shafting and the like. Their Monarch standard scales are manufactured in a large variety of patterns. There are described and illustrated wheel and keg jointers, barrel steamers, trussing machines, barrel lathes, heading up machines, foot power punching and shearing machines, hoop riveting machines, swing saws and barrows of various kinds.

Compress Polishing Wheels.—A dainty catalogue describing Compress polishing wheels, telling how they are made, what they will do and how they do it, has been issued by the Compress Wheel Company, 16 North Canal street, Chicago. Illustrations are given, showing the method of construction and some of the forms in which the wheels are finished for special work. A partial list of users is printed, which indicates the great variety of trades in which these wheels are found desirable as well as the high character of the establishments on the company's books as customers.

Wood Trimmers.—The American Machinery Company, Grand Rapids, Mich., have issued an exceedingly dainty catalogue, comprising 16 pages, which sets forth special features of the Oliver wood trimmer. This machine is designed to trim a rough end of hard or soft wood either square or at any angle and leaves a trimmed surface so smooth that fine sandpaper will scratch it, and at the same time so accurate that daylight cannot be seen through when two trimmed ends are placed together. This trimmer is a hand power tool and is made in a variety of sizes to cover the various special purposes for which it may be desired. It is intended for the use of pattern makers, cabinet makers, millwrights, carpenters or manual training instructors.

Formal announcement has been made of the transfer to the Pullman Company of the property and business of the Wagner Palace Car Company, which went into effect at the end of the year. A certificate has been filed in Illinois of the increase of the capital of the Pullman Company from $54,000,000 to $74,000,000.

Navy Yard Machine Tools.

A Considerable Number of Bids Rejected.

Out of the list of 194 machine tools and jacks for which bids were received by the Navy Department last October all of the bids for 54 machines have been thrown out and the items marked, "no award." This means that at present only 112 machines will be contracted for and the set of 28 jacks. This equipment, it will be recalled, is for installation in the new machine shop which is being erected at the Brooklyn Navy Yard. Among the rejected 54 are many good-sized tools, in fact the largest of the entire lot specified will not be purchased. The tool referred to is the 125 x 108 inch x 40-foot crank shaft engine lathe. We are informed by an official of the Department that the only bid on this machine was submitted by Bement, Miles & Co. This bid, he said, named $35,415 as the price. It has practically been decided to purchase instead of this lathe one that will be just a little smaller and for which there can be several bidders. As will be seen from the list given below, a 96 inch planer, five 72-inch drills and numerous other large tools were also turned down. Of course the prices named in the bids influenced greatly their rejection. Another point which should not be lost sight of is that a great many very fine tools have recently been installed in the temporary shops at the Brooklyn yard by Chief Engineer J. A. B. Smith. A large crank shaft engine lathe will, however, be a necessity at the new shop and will be purchased.

Recommendations for the purchase of the balance of the tools have been made at Washington. This means that the orders have been practically awarded, although we are informed that until this time no official awards have been made and no contracts given out. They will be in the hands of the successful bidders within a few days.

A summary of the bids, giving prices named, was printed in *The Iron Age* under the date of October 12, 1899.

This is how we understand the recommendations have been and awards will be made:

THE NILES TOOL WORKS COMPANY.

Classes 38, 39, 40 and 41, consisting of four 30 inch vertical drill presses; classes 46, 47, 48 and 49, consisting of four 21-inch vertical drills; class 66, one Universal milling machine with 33-inch table feed; class 67, one Universal milling machine with 28-inch table feed; class 68, one No. 2 Universal milling machine with 26½ inches table feed, one 17-inch Universal milling machine; class 71, one plain milling machine with 48 inches longitudinal movement; classes 72 and 73, consisting of one No. 2 and one No. 1 plain milling machine; classes 103, 104 and 105, three 20-inch back geared screw cutting lathes having 10-foot beds; classes 119 and 120, each consisting of a 12-inch back geared engine lathe with 6 foot bed; class 123, one 14 inch toolroom lathe; class 124, one 20 inch brass lathe; class 126, one 18-inch back geared brass lathe; classes 130 and 131, each consisting of one 1½ inch screw machine; class 132, one strapping lathe; classes 138 and 139, two 15 inch post shapers; classes 146 and 147, two 24-inch shapers; class 166, one bulldozer press.

MANNING, MAXWELL & MOORE.

Class 10, one 96-inch horizontal boring, drilling and milling machine; class 14, one Betts 60 inch horizontal drilling and boring machine; class 23, one extra heavy 10 x 16 foot boring mill; class 74, one No. 0 plain milling machine; class 75, one nut milling machine; class 78, one extra heavy engine lathe, 60 inch swing, 70 feet between centers; class 79, one 54 inch triple geared engine lathe with 24 foot bed; classes 107, 108 and 109, consisting of three 18 inch back geared screw cutting engine lathes with 8-foot bed; class 128, one 16 inch back geared brass lathe; class 133, one 2 x 24 flat turret lathe; class 154, one Universal cutter and reamer grinder; class 156, one tool grinder; class 159, one lathe center grinder.

THE AMERICAN TOOL WORKS COMPANY.

Class 3, one 48 inch planer, 14-foot bed; class 6, one 36-inch planer, 12-foot bed; class 7, one 36-inch planer, 20 foot bed; class 21, one vertical boring and turning mill capable of taking in work 62 x 40 inches; classes 25 and 26, two 72 inch Universal radial drills; classes 29, 30 and 31, three 72 inch radial drills.

U. BAIRD MACHINERY COMPANY.

Class 70, one vertical milling machine; class 97, one 24-inch back geared screw cutting engine lathe, 10-foot bed; class 99, one 24-inch screw cutting engine lathe, 12-foot bed; classes 140 and 141, two 22-inch post shapers; class 153, one special double end grinding machine; class 155, one 5-wheel floor grinder; class 158, one bolt pointing machine.

PRENTISS TOOL & SUPPLY COMPANY.

Class 16, one 30 inch boring and turning mill; class 17, one 37-inch boring and turning mill; classes 18 and 19, two 42-inch boring and turning mills; classes 54, 55 and 56, three 16-inch sensitive drills.

THE FAIRBANKS COMPANY.

Classes 60, 61 and 62, three 13-inch sensitive drills (Wasburn); class 89, one 30-inch screw cutting engine lathe, 14 foot bed; class 91, one 30-inch screw cutting engine lathe, 16-foot bed; class 164, one combined cutting off lathe and nut and bolt head facing machine; class 167, one set of 28 hydraulic jacks ranging from 4-ton 12 inch lift to 30-ton 18-inch lift.

HILL, CLARKE & CO.

Class 84, one 36 inch triple geared engine lathe to have 40-foot bed; classes 87 and 88, two 32 inch triple geared engine lathes, 16-foot beds; classes 93 and 94, two 28-inch screw cutting engine lathes with 12 foot beds.

PRATT & WHITNEY.

Class 9, one 16-inch planer, 4-foot bed; class 76, one screw slotting machine; classes 117 and 118, two 16-inch back geared engine lathes to have 10-foot beds; class 157, one bolt pointing machine.

WALTER H. FOSTER.

Classes 134 and 135, two triple geared turret lathes, 26-inch swing and 10-foot bed; class 149; one 48 inch portable shaper (Morton); class 150, one 48-inch portable key seating and slotting machine.

E. A. KINSEY & CO.

Classes 113, 114 and 115, including three 16-inch bake geared engine lathes with 8 foot beds; classes 160 and 162, two twist drill grinders.

BEMENT, MILES & CO.

Class 12, one horizontal boring and milling machine, 8-foot table; class 13, one horizontal boring and milling machine, 10 foot table; class 24, one 9-foot Universal radial drilling machine; class 151, one 20-inch slotter.

NEW HAVEN MFG. COMPANY.

Classes 35 and 36, two 37-inch back geared power feed drill presses; class 152, one 10-inch slotting machine.

FITCHBURG MACHINE COMPANY.

Class 80, one 48-inch triple geared engine lathe, 20-foot bed; class 142, one double 16-inch shaper; class 144, one 18-inch double shaper.

DIETRICK & HARVEY.

Class 15, one 40-inch Universal horizontal drilling and boring machine.

BULLARD MACHINE TOOL COMPANY.

Class 22, one 76 inch boring and turning mill.

WILLIAM SELLERS & CO., INCORPORATED.

Class 2, one 60-inch planer with 18-foot bed.

NO AWARD.

Class 1, one 96 inch planer, 22-foot bed; class 4, one 42-inch planer, 12-foot bed; class 5, one 36-inch planer, 8 foot bed; class 11, one portable milling, boring and drilling machine; class 20, one 51-inch boring and turning mill; classes 27 and 28, two 72-inch semi-Universal drills; classes, 32, 33 and 34, three 72-inch radial drills; class 37, one 37 inch back geared drill press; classes 42, 43, 44 and 45, four 30 inch back geared drill presses; classes 50, 51, 52 and 53, four 21-inch vertical drills; classes 57, 58 and 59, three 16 inch sensitive drills; classes 63, 64 and 65, three 13 inch sensitive drills; class 77, one 125-inch crank shaft engine lathe, 40 feet between centers; class 81, one 42-inch triple geared engine lathe, 16-foot bed; classes 85 and 86, two 32 inch triple geared engine lathes, 12 foot beds; class 90, one 30 inch screw cutting engine lathe, 14-foot bed; class 92, one 30-inch screw cutting engine lathe with 16 foot bed; classes 95 and 96, two 28 inch screw cutting engine lathes, 12 foot beds; class 98, one 24-inch screw cutting engine lathe, 10-foot bed; class 100, one 24 inch screw cutting engine lathe, 12-foot bed; classes 101, 102 and 106, three 20-inch screw cutting engine lathes, 10-foot beds; classes 110, 111 and 112, three 18 inch screw cutting engine lathes, 8-foot beds; class 116, one 16 inch back geared engine lathe, 8 foot bed; classes 121 and 122, two 12-inch back geared engine lathes, 6-foot beds; class 125, one 20 inch brass lathe, 7-foot bed; class 127, one 18-inch back geared brass lathe, 7-foot bed; class 129, one 16-inch back geared brass lathe, 6-foot bed; classes 136 and 137, two 22-inch back geared turret lathes, 10-foot beds; class 143, one double 16 inch shaper; class 145, one double 18 inch shaper; classes 161 and 163, two twist drill grinders; class 165, one rotary nut tapping machine.

Information Wanted.—A correspondent wishes the address of manufacturers of nickeline.

The sale of the equipment of the Wilcox & Howe Company of Derby, Conn., has been postponed to January 13.

MANUFACTURING.

Iron and Steel.

Stockholders of the National Tin Plate Company holding patents on a new process for manufacturing tin plate met in Pittsburgh last week and elected the following directors: J. C. McDowell, vice-president and general manager of the Philadelphia Company; Judge James A. Beaver of Bellefonte, Pa.; J. L. Lewis, connected with the Standard Oil Company; N. E. Whitaker of Wheeling; W. A. Rodgers, son of William Rodgers, the inventor of the process, and A. B. Daily, Jr., of the Wheeling Gas Company. Mr. McDowell was elected president, Judge Beaver vice-president, J. L. Lewis secretary and A. B. Daily, Jr., treasurer. Two provisional plans in relation to capitalization were approved. One is that if the company decide to erect plants and manufacture the product their capital stock is to be $5,000,000, and the other is that in case it is decided to allow some other concern to use the patents on royalty the capital is to be $1,000,000.

Jones & Laughlins, Limited, operating the American Iron & Steel Works, Pittsburgh, Pa., have been putting in some additional soaking pits or heating furnaces at their Bessemer steel works which should increase their output very materially, probably 500 to 700 tons per day. This additional production will become available early in January. This concern contemplate moving their 26-inch structural mill to another part of the works, in order to increase the output and give it more room. This, however, will not be accomplished short of four to six months. This concern are still doing a vast amount of work at their Eliza blast furnace plant in completion of the furnaces now under way. One more of the new furnaces should be in operation in the course of a month or six weeks.

The Demmler works of the American Tin Plate Company, at Demmler, Pa., which have been idle for some weeks, have resumed operations.

The Park Steel Company of Pitsburgh state officially that they will not remove their plant from Pittsburgh.

The Carnegie Steel Company, Limited, will introduce a pay car at the Edgar Thomson Steel Works, blast furnaces and foundry at Bessemer, Pa., to pay the 4500 workmen there on the company's first pay day this month. The car and method of paying will be the same as used in paying the employees at the Homestead Steel Works.

Taking effect January 1, wages of employees of the Dunbar Furnace Company and the Semet-Solvay Company, operating blast furnace and by-product coke plant at Dunbar, Pa., were advanced 5 per cent. The advance affects the wages of about 500 employees.

The question of the ownership and operation of the Continental wire mill, at Granite City, Ill., promises to take a new form. The American Steel & Wire Company own the bonds, covered by a mortgage on the plant, but some time since the court ordered the receiver to lease it, and it has latterly been started by the Merchants' Wire & Nail Company of St. Louis. On the 30th ult., however, in the United States Circuit Court at Springfield Judge William J. Allen entered a decree of foreclosure and sale. The suit was brought by S. Leonard Boyce of Chicago, trustee, against the Continental Company, William E. Ware, Georgiette E. Wolfe and Daniel R. Wolfe, all of St. Louis. Bonds to the amount of $125,000 were issued by the company on December 14, 1896, payable June 14, 1898, with interest at 6 per cent. per annum. A deed of trust was issued to secure the bonds. The plant was closed, and default was made on every payment of interest and principal on the bonds. The sale of the property is ordered to take place next Thursday in Granite City.

The weldless tube factory of Ellwood City, Pa., manufactured their last tubing last week. The splendid equipment of this mill will all be torn up, and it is thought by those in charge that it will be moved to the Greenville mill, where it will be put in operation. The building, which is one of the most modern and best constructed factory buildings in that place, will not be removed, but it is reported that it will be converted into a tin mill. The new factory is looked upon very expectantly by the people of Ellwood City.

The Wright Shovel Company, Anderson, Ind., are not removing their entire works to Elwood, Ind., as reported in the daily press. They are removing the rolling mill and some of the welding hammers, but the shovel works will remain at Anderson. The vacated portion of the Anderson plant will probably be refilled with other machinery.

The American tin plate mill at Ellwood City, Pa., which has been closed for five weeks for necessary repairs, will resume operations not later than January 15. Those having the contract for repairing the mill have received official notice to hasten their work as much as possible, that the mill may be started on an hour's notice from the company.

It is stated that negotiations are pending which may result in a tin plate plant being built at Altoona, Pa., next spring. W. H. and L. C. Wolfe of Altoona and several New York and Boston capitalists are reported as being connected with the project.

The Riter-Conley Mfg. Company of Pittsburgh have been given a contract for building a new forge shop for the Reading Iron Company, Reading, Pa. It will be 500 feet long, with 100-foot span. The equipment includes four steam hammers and modern machinery throughout.

At a special meeting of the Board of Directors of the Sharon Steel Company, held at Sharon, Pa., last week, John Stevenson, Jr., of New Castle was elected vice-president in place of Geo. W. Darr of Pittsburgh, who resigned. J. S. Fruit and H. P. Forker, directors, resigned. V. M. Dalamater and John Stevenson, Jr., were chosen to fill the vacancies. Mr. Stevenson has purchased a residence and will hereafter make his home there in place of at New Castle.

The contract for the large extensions to the plant of the Carbon Steel Company was awarded to Wm. B. Scaife & Sons, Pittsburgh, Pa. The specifications consist of a great amount of plate girder work and steel frame construction.

The Malta Iron Company, Sparta, Minn., have been organized, with a capital of $50,000, for mining and smelting iron, steel, copper, &c. The incorporators are H. A. Kelley, F. J. Miller and A. C. Dustin.

The stockholders of the Lackawanna Iron & Steel Company of Scranton, Pa., have authorized the increase of the capital stock from $3,750,000 to $25,000,000. The company propose to enlarge their facilities by building a large plant at Buffalo, for which plans are now being drawn. It is not the intention to issue the entire additional stock, but only such part of it as the new plant shall require.

Machinery.

The Otto Gas Engine Company, through their Pittsburgh office, have contracted to install for the Oliver Iron & Steel Company of Pittsburgh a 100 horse-power and a 60 horse-power Otto engine, new type; also one 60 horse-power Otto gas engine, special electric type, for Zug & Co. The latter concern installed a 35 horse-power Otto gas engine in their new galvanizing plant at Sixty-first street, Pittsburgh.

The business of the Ashton Valve Company of Boston, Mass., the past year has grown to such an extent that it has necessitated a large amount of night work in their factory. To offset this and yet be in a position to satisfactorily fill the constantly increasing demand for their goods, they have decided to enlarge their factory by the addition of another story to their building, giving five floors instead of four. With these increased facilities and the addition of considerable improved machinery they will shortly be in a position to turn out at least one-third more than has ever been possible in the past.

The Weimer Machine Works Company of Lebanon, Pa., have received the order from the Pennsylvania Forge Company, Sheridan, Pa., for their blowing engines for the new furnace. The engines will be of the vertical type, cross compound condensing. Each pair of engines will have a 42-inch diameter high pressure steam cylinder, 82-inch diameter low pressure steam cylinder. The blowing cylinders will be 84-inch diameter, the stroke of the engines will be 60 inches. The steam cylinders are of the Corliss type and the engines will be of heavy design, each pair weighing about 750,000 pounds.

Among those who have recently purchased a Helwig pneumatic stay bolt clipper are the Northwestern Railroad Company, Brownell & Co. of Dayton, Ohio; Atlas Engine Works of Indianapolis, C., St. P., M. & O. Railway Company, Minneapolis & St. Louis Railway Company, who say this clipper gives the very best satisfaction.

The Bates & Edmonds Motor Company, Lansing, Mich., have been incorporated, with a capital of $25,000, for the manufacture and sale of gas engines. The incorporators are J. P. Edmonds, M. F. Bates, R. W. Morse, C. C. Longstreet.

The Rarig Engineering Company, Columbus, Ohio, have received an order for two engines for the new blast furnace of the Republic Iron & Steel Company at Thomas, Ala. The engines will be of the cross compound steeple type, with a new design air valve, and will require 750 tons of iron for their construction. Each engine will be 45 to 50 feet high, with a fly wheel weighing 80 tons and 25 feet in diameter. The engines will be delivered in eight months.

Some prominent citizens of Salem, Ohio, have offered to take stock to the amount of $30,000 and give a free site to the Ohio Steel Mfg. Company, which concern propose to erect a plant for the manufacture of steel castings. The concern originally decided to locate at Canton, but are dissatisfied with the inducements offered to go there.

The Marine Vapor Engine Company, builders of launches, have been occupying lands at Jersey City, N. J., leased for short terms from the Central Railroad of New Jersey. Being unable to secure a long time lease the company have been putting up a new plant at Newark, N. J., into which the equipment has been moved, the main building being 100 x 200 feet. The new offices will be occupied next week.

The Republic Iron & Steel Company are building a new shafting works at the Mahoning Valley plant, but it will not cost several hundred thousand dollars as reported in the daily press. The concern expect to produce about 1500 tons of finished shafting per month, which is about three or four times the tonnage they are now making at their old works.

The Iron and Metal Trades.

As is natural, the volume of transactions during the holiday week has been light, particularly since many buyers are well covered far into the future, while others are waiting to watch developments during this, the critical period of the year, as revealing the trend of requirements for future demand.

The fact that all the principal sellers of Bessemer Billets are naming a uniform price, based on $35 for Billets and $36 for Slabs, at mill, in the Central West, has given rise to the report that a pool has been formed. According to our advices a number of the large producers of Bessemer Steel have had some conferences at which the necessity was discussed of presenting a united front to the attacks on the Steel market which have been recently made. We are advised that while there is no formal organization harmonious action will be promoted.

It is argued that practically all of the large producers of Bessemer Steel have been forced to purchase Bessemer Pig in the open market at the prices recently ruling, so that the cost for such of their Steel product as is marketed as such is high. This apparently places the small rolling mills, who must supply themselves from others, in a difficult position should the values of various finished products recede materially. Many of them, of course, are partially or wholly supplied by their own Open Hearth Steel plants.

In Pig Iron the movement has been light in all parts of the country. Some transactions of magnitude in Foundry Iron have come to our notice which indicate that some sellers are willing to make concessions to secure the trade of good customers.

Over a contract of about 10,000 tons of Cast Iron Pipe at Philadelphia there was quite a sharp struggle between the consolidation and certain independent shops. About 7000 tons was secured by the consolidation, while 3000 tons, chiefly smaller sizes, went to an Eastern plant. Generally speaking, the Pipe trade is dull, the active season not having set in as yet.

In Finished Iron products the chief event of the week was the advance of 25c. per 100 lbs. decreed on Wire Nails and Barbed Wire.

A curious state of affairs has developed in connection with the bids for bridge work for the British Government for South Africa. One of the American companies have had their bid rejected, in spite of the fact that their price was much below that of the English firm to whom the work has been awarded. The pretext appears to have been that the structure is too light. We understand that in anticipation of such a claim the American engineer went over his figures and added weight up to the point when further additions would impair rather than improve the carrying capacity. Even with these modifications the weight of the spans was only 70 per cent. of that of the English designs. It looks as though our British friends either decline to learn, or have determined to keep the work at home. It is not such a victory as English cables would have us believe.

A Comparison of Prices

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Jan. 3, 1900.	Dec. 27, 1899.	Dec 6, 1899.	Jan 4, 1899.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	$23.25	23.25	.....	$11.25
Foundry Pig, No. 2, Southern, Cincinnati	*20.50*	20.50	20.75	10.25
Foundry Pig, No. 2 Local, Chicago	23.50	23.50	23.50	11.00
Bessemer Pig, Pittsburgh	24.90	24.90	24.90	10.75
Gray Forge, Pittsburgh	21.25	21.00	21.25	9.50
Lake Superior Charcoal, Chicago.	*25.50*	25.00	25.50	11.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	**35.00**	33.00	34.00	16.25
Steel Billets, Philadelphia	**37.50**	nom	36.00	18.55
Steel Billets, Chicago	nom	nom	.....	17.50
Wire Rods, Pittsburgh	50.00	nom	.....	22.25
Steel Rails, Heavy, Eastern Mill	35.00	35.00	35.00	18.00
Spikes, Tidewater	2.65	2.65	2.65	1.40
Splice Bars, Tidewater	*2.30*	2.30	2.35	1.05
OLD MATERIAL:				
O. Steel Rails, Chicago	*19.00*	19.00	20.00	8.00
O. Steel Rails, Philadelphia	21.00	22.00	.....	10.25
O. Iron Rails, Chicago	*25.00*	25.00	28.00	12.75
O. Iron Rails, Philadelphia	27.00	27.00	.....	13.00
O. Car Wheels, Chicago	21.00	20.00	21.00	11.50
O. Car Wheels, Philadelphia	20.50	21.00	.....	10.25
Heavy Steel Scrap, Chicago	*18.00*	18.00	19.00	7.75
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	2.05	2.05	....	1.15
Common Iron Bars, Youngstown	**2.15**	2.15	2.10	1.00
Steel Bars, Tidewater	*2.35*	2.35	2.45	1.10
Steel Bars, Pittsburgh	2.20	2.20	2.20	1.00
Tank Plates, Tidewater	*2.40*	2.40	2.55	1.30
Tank Plates, Pittsburgh	*2.25*	2.25	2.35	1.25
Beams, Tidewater	2.40	2.40	2.40	1.40
Beams, Pittsburgh	2.25	2.25	2.25	1.30
Angles, Tidewater	2.40	2.40	2.40	1.25
Angles, Pittsburgh	2.25	2.25	2.25	1.15
Skelp, Grooved Iron, Pittsburgh	*1.90*	1.95	1.97½	1.07½
Skelp, Sheared Iron, Pittsburgh	*2.30*	2.35	2.35	1.22½
Sheets, No. 27, Chicago	3.00	3.00	3.00	2.00
Sheets, No. 27, Pittsburgh	*2.80*	2.80	2.85	1.85
Barb Wire, f.o.b. Pittsburgh	**3.80**	3.55	3.55	1.80
Wire Nails, f.o.b. Pittsburgh	**3.20**	2.95	2.95	1.35
Cut Nails, Mill	**2 50**	2.45	2.45	1.12½
METALS:				
Copper, New York	*16.00*	16.25	17.00	13.25
Spelter, St. Louis	4.35	4.55	4.35	4.75
Lead, New York	**4.70**	4.70	4.60	3.92½
Lead, St. Louis	**4.65**	4.60	4.50	3.75
Tin, New York	*25.50*	24.00	27.00	19.70
Antimony, Hallett, New York	9.75	9.75	9.75	8.75
Nickel, New York	*38.00*	38.00	40.00	38.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York	4.84	4.84	4.81	2.90

Chicago. (*By Telegraph.*)

Office of *The Iron Age*, 805 Fisher Building,
CHICAGO, January 3, 1900.

While business has been comparatively quiet for the past 60 days, taking trade as a whole, values have been well sustained. Buyers who have been looking for recessions have found them only in Sheets and Plates, in which the declines were due to special causes not operative on other products. A movement in the other direction was made in the case of Wire Nails, which were marked up $5 per ton, effective on Saturday last. Indications are now seen of a better demand for Iron and Steel, which is expected to develop into much more activity as the month advances. Iron and Steel manufacturers are entering upon the new year in magnificent shape. They never before began a year with so much tonnage booked and also at such remunerative prices. A special feature of the immediate situation is the scarcity of Coke, which is causing much inconvenience to a large line of consumers.

Pig Iron.— Freight rates have been advanced 15c. to 50c. per ton from Eastern points, but no change has been made in rates in Southern Iron. The advances affect Virginia Iron more than Iron from other localities. New business is quiet at present, but some inquiries are being received and the market is not absolutely stagnant. All furnace companies are behind on deliveries, but the local producers are especially, having difficulty in satisfying their customers. Much more Iron has been sold than can be delivered, according to contract. We quote for cash as follows:

Lake Superior Charcoal	$25.50 to $26.00
Local Coke Foundry, No. 1	24.50 to 25.00
Local Coke Foundry, No. 2	23.50 to 24.00
Local Coke Foundry, No. 3	22.50 to 23.00
Local Scotch, No. 1	25.00 to 25.50
Ohio Strong Softeners, No. 1	25.50 to 26.00
Southern Silvery, according to Silicon	25.50 to 27.00
Southern Coke, No. 1	22.85 to 23.85
Southern Coke, No. 2	21.85 to 22.85
Southern Coke, No. 3	21.10 to 21.85
Southern Coke, No. 1 Soft	22.85 to 23.85
Southern Coke, No. 2 Soft	21.85 to 22.85
Foundry Forge	20.85 to .....
Gray Forge and Mottled	20.85 to .....

Southern Charcoal Softeners, according to Silicon	21.85 to	25.85
Alabama and Georgia Car Wheel	24.85 to	25.85
Malleable Bessemer	25.00 to	26.00
Standard Bessemer	..... to	.....
Jackson County and Kentucky Silvery, 8 per cent. Silicon	32.00 to	32.50

Bars.—Manufacturers of Bar Iron report a better buying movement, which is not of great extent, but of an encouraging character. Jobbers and consumers who have been waiting for lower prices have accepted the strength of the situation and are covering their requirements for the next two or three months. The situation in Soft Steel is hardly as strong as in Iron, some contracts having recently been taken under the market, but the disturbing influences are believed to be only temporary. Mill shipments are quoted at 2.30c. to 2.40c., Chicago, for either Common Iron or Soft Steel Bars, and 2.65c. for Bands. Jobbers continue to quote small lots from stock at 2.90c. upward for Bar Iron, 2.65c. upward for Soft Steel Bars, and 3.90c. to 4c. for Norway and Swedish Iron.

Structural Material.—Trade in this line is decidedly quiet. Prospects, however, are hopeful for the coming year. Manufacturers are inclined to a little more firmness on Universal Plates. Mill shipments are quoted as follows, Chicago delivery: Beams, Channels and Zees, 15-inch and under, and Angles, 3 to 6 inches, 2.40c.; Beams, &c., 18 inches and over, and Angles over 6 inches and under 3 inches, 2.50c.; Tees, 2.45c.; Universal Plates, 2.60c. to 2.70c. The local yards continue to have a good trade in small lots.

Plates.—A fair volume of business is being done, with some better demand for mill shipments. Plate manufacturers are of the opinion that the weakness recently prevailing in this line will give way to a much better condition in the course of a few weeks as the consumption is not only heavy but increasing. Mill shipments, Chicago delivery, are quoted as follows: Tank, 2.70c. to 2.75c.; Flange, 3.10c. to 3.20c.; Marine, 3.30c. to 3.50c.; Fire Box, 4c. to 5½c. Jobbers quote Tank from store at 3.10c. to 3.25c., and Flange, 3.25c. to 3.50.

Merchant Pipe.—It is a little too early to expect much improvement in the local demand. Carload lots are quoted at 50, 10 and 5 to 50 and two 10's, while less than carloads are selling at 50 and 10 to 50, 10 and 5 per cent. Merchant Steel Boiler Tubes are quoted as follows: 1¼ to 1¾ inch, 35 per cent. off on Steel or Iron; 2 to 2¾ inch, 50 per cent. off on Steel and 45 per cent. off on Iron; for 3-inch and larger, 52½ per cent. off on Steel, 47½ per cent. off on Iron.

Sheets.—It had been expected that the situation would continue to improve, but some of the manufacturers are anxious for business and continue to sell at the same rates which have recently been quoted. The demand is spasmodic, occasionally being strong and then light. Mill shipments of No. 27 Black are quoted at 3c. to 3.25c., Chicago, and Galvanized Sheets at 75 and 5 to 75 and 10 per cent. Jobbers report small lots still selling at 3.25c. to 3.40c. for No. 27 Black, and 70 and 10 to 75 per cent. off on Galvanized Sheets.

Merchant Steel.—New business is fair for the season. This is usually an extremely quiet period. Some buying is taking place, however, and good specifications are received on contracts. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 2.95c. to 3.05c.; Smooth Finished Tire, 2.80c. to 3c.; Open Hearth Spring Steel, 3.60c. to 3.75c., base; Toe Calk, 3.20c. to 3.50c., base; Sleigh Shoe, 2.75c. to 3c.; Cutter Shoes, 3.45c. to 3.65c.; Ordinary Tool Steel, 7c. to 7½c.; Special, 13c. and upward. Jobbers are quoting from store: Crucible Spring Steel, 6c. rates; Open Hearth Spring Steel, 5c.; Smooth Machinery Steel, 5½c.; Toe Calk Steel, 4c.

Billets and Rods.—A sale is reported of 5000 tons of Open Hearth Billets for Car Axles at $45.50. Inquiries are out for 2000 tons more, but the local manufacturers are completely sold up. An export inquiry for 2000 tons of Wire Rods is in the market, but local manufacturers cannot entertain it.

Rails and Track Supplies.—Considerable business is pending, but not much has been booked during the week for Heavy Section Rails. Prices range from $35 to $40, according to quantity. The demand for Light Rails keeps up to the output of the local mills, Light Sections being quoted at $35 to $45. Japanese buyers are in the market for 4000 tons of Light Rails, and a large quantity of bridge work. Prices of Track Fastenings are as follows: Steel Fish Plates, 2.25c. to 2.50c.; Iron Fish Plates, 2.30c to 2.50c.; Spikes, 2.65c. to 2.75c.; Track Bolts, with Hexagon Nuts, 3.95c. to 4c.; Square Nuts, 3.80c. to 3.85c.; Steel Links and Pins, 3.20c.; Iron Links and Pins, 3.15c.

Old Material.—Offers of most classes of Old Material are steadily increasing. The quantity available is now very large and consumers are naturally buying as little as possible, waiting further reductions in prices. High Grade Scrap maintains its value quite well, as the supply is less pressing than of the cheaper grades. Approximate market prices are as follows per gross ton:

Old Iron Rails	$25.00 to $26.00
Old Steel Rails, mixed lengths	19.00 to 20.00
Old Steel Rails, long lengths	22.00 to 23.00
Relaying Rails	28.00 to 30.00
Old Car Wheels	21.00 to 22.00
Heavy Melting Steel Scrap	18.00 to 19.00
Mixed Steel	13.50 to 14.00

Following prices are per net ton:

No. 1 Railroad Wrought	$24.00 to $25.00
No. 1 Railroad Track	19.00 to 20.00
Dealers' Forge	15.50 to 16.00
Iron Fish Plates and Angle Bars	24.00 to 25.00
Steel or Mixed Iron and Steel ditto	19.00 to 20.00
No. 1 Cut Mill, for busheling	12.50 to 13.00
Pipes and Flues	12.50 to 13.00
Heavy Cast	13.00 to 14.00
Stove Plate	8.50 to 9.00
Railroad Malleable Cast	15.00 to 15.50
Agricultural Malleable Cast	14.00 to 14.50
Iron Car Axles	26.00 to 27.00
Steel Car Axles	22.00 to 23.00
Horseshoes	16.00 to 16.50
Cast Borings	9.00 to 9.50
Steel Car Axle Turnings	11.50 to 12.00
Iron Car Axle Turnings	12.50 to 13.00
Machine Shop Turnings	10.00 to 11.00
Old Boilers, Iron, whole	7.00 to 8.00
Old Boilers, Iron, cut	11.50 to 12.00
Old Boilers, Steel, whole	6.00 to 7.00
Old Boilers, Steel, cut	10.00 to 11.00

Metals.—Copper is firmer and carload lots of Lake are now held at 17c., with Casting brands unchanged at 16⅝c. Spelter is steady at 4.62½c. to 4.70c. Pig Lead is in good condition, with a better outlook for trade, and Desilverized firmly held at 4.70c. for January.

The Billet situation is looking better. The National Steel Company say sales have been larger the past ten days than for several weeks preceding. They have sold Sheet Bars at $37, at mill, in the Pittsburgh district. They deny reported agreement among makers, and think nothing of the kind could be effected.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building,
PITTSBURGH, January 3, 1900.

(By Telegraph.)

Pig Iron.—The Pig Iron market is extremely quiet and only small lots are being sold. Bessemer Pig for first half continues strong at $24 at furnace. A small lot has been sold at $25, Pittsburgh, equal to $24.10, Valley. Forge Iron is firm at $20.75 to $21 at furnace and $21.25 to $21.50, Pittsburgh. Foundry Iron is rather quiet, and No. 2 is held at $22.75 to $23, Pittsburgh. We quote Bessemer, $24; Forge, $20.75 to $21, both at Valley furnace; No. 2 Foundry, $22.75 to $23; Bessemer, $24.90 to $25; Mill Iron, $21.25 to $21.50, all f.o.b. Pittsburgh. We note a sale of 2000 tons of Bessemer at $25, Pittsburgh, January and February delivery, and one of 3000 tons for January, February and March, at $24, Valley furnace.

Steel.—The market is quiet and no Steel of any account has been sold for some time. There is a good deal of inquiry, but ideas of buyers and sellers are still far apart. The mills are very firm in their ideas as to prices and are quoting the uniform price of $35 for Billets and $36 for Slab sizes, f.o.b. maker's mill, Pittsburgh, Youngstown, Lorain and Wheeling. This price is equal to $37.50 delivered in Philadelphia district.

Sheet Bars.—We note a sale of 6000 tons of Sheet Bars, 2000 tons a month for January, February and March. We quote nominally at $36 for Bars, long lengths.

Muck Bars.—We note a sale of 300 tons of Muck Bar at $32.50, delivered f.o.b. Pittsburgh.

Coke.—There is an enormous demand for Coke and fancy prices are being paid. We are advised that Furnace Coke, deliveries running over first half, has sold at $3.25 a ton, at oven. As high as $3.50 has been paid for small lots of Furnace Coke for prompt shipment. Both Foundry and Furnace Coke are very scarce and it looks as though prices would be still higher.

(By Mail.)

The first week in the new year finds the Iron trade in fairly satisfactory condition. While the demand for

Finished Material, and Pig Iron and Steel as well, has been quiet for some time, yet it is believed that as the holiday season is over, and the mills have made necessary repairs and taken inventory, there will be a better demand for material. The principal event of the week has been the advance of $5 a ton in Nails and Wire, effective December 30. Prices on other kinds of Finished Material are practically without change. The price of Billets has been fixed at $35 f.o.b. Pittsburgh, and $36 for Slab sizes. Pig Iron is quiet but strong at $24 Valley, for Bessemer for first half. Advanced freights on Pig Iron, Coke, Cinder, Scale, and Finished Iron and Steel, went into effect January 1.

Ferromanganese. — Demand is for small lots only, for which the price charged by the local producer is $125 a ton maker's mill.

Beams and Channels.— A good deal of work is in sight, involving considerable tonnage, but it will likely be some little time before it is placed. Considerable tonnage was carried over from last year, and the Beam mills are all filled up from two to four months ahead. Prices are unchanged, and we quote: Beams and Channels, 15-inch and under, 2.25c.; 18, 20 and 24 inch, 2.35c.; Angles, 3-inch and up to 6 x 6, 2.25c.; Angles, under 3-inch, 2.50c.; Tees, 3-inch and larger, 2.30c.; under 3-inch, 2.50c.; Zees, 3-inch and larger, 2.25c.; Grooved Rolled Plates, 2.50c., Pittsburgh.

Plates.— There has been no change in the Plate market since our report of last week. Prices on Tank are weak, but on better grades are fairly well maintained. There is not much tonnage being placed, but most of the local mills are pretty well filled up for the next two or three months. We quote Tank, ¼-inch and heavier, 2.25 to 2.50c., the lower price for narrow Plates and the higher for wide sizes. Shell, 2.50c. to 2.60c.; Flange, 2.60c. to 2.70c.; Marine, 2.70c. to 2.80c.; Fire Box, 3c. to 3.25c., depending on quality. For desirable orders, particularly for Tank Plate, it is probable some mills would shade these prices.

Bars.—The market is very quiet, which is nothing unusual at the holiday season. Considerable improvement in demand is expected in January. We quote Common Iron Bars at 2.15c., Valley mill, and Steel Bars at 2.20c. to 2.25c., Valley mill. Local mills quote Steel Bars at 2.25c. to 2.40c., depending on the order.

Sheets.— While prices are no higher, there is a better feeling in Galvanized Sheets, and the tone of the market is stronger. It is reported that the move to consolidate some of the Sheet mills is still under way, and with fair prospects of going through. We continue to quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.80c.; No. 28, 2.90c. We quote Galvanized Sheets at 75 and 7½ per cent., to 75 and 10 per cent., 15c. freight allowance. We are advised that some mills are refusing to quote as low as the above prices.

Merchant Steel.—The situation is very quiet, but specifications on old contracts are coming forward very freely. The tone of the market is only fairly strong. We quote: Toe Calk, 2.75c., base; Tire, 2.75c., base; Open Hearth Spring, 3.25c. to 3.50c.; Plow Slabs, 3-16 and heavier, 2.75c. to 3c.; Bessemer Machinery, 2.75c. to 3c.; Sleigh Shoe, 2.75c. to 3c.; Cutter Shoes, tapered and bent, 3.75c. to 4c.; Cant Hook Steel, Open Hearth, 4c. to 4.25c.; Crucible, 5c. to 5.25c.; Tool Steel, 7c. and upward, freight allowance not to exceed 25c. Terms, net cash 30 days.

Steel Rails.— No large tonnage has recently been placed. We quote at $35 to $37 at mill for Standard Sections.

Skelp. —The market continues very quiet, and prices on Skelp are weak, particularly on Iron. We quote Grooved Iron Skelp at 1.90c. to 1.95c., and Grooved Steel Skelp, 1.95c. to 2c.; Sheared Iron Skelp, 2.30c. to 2.35c.; Sheared Steel Skelp, 2.35c. to 2.40c., delivered buyers' mill. Steel Skelp for Boiler Tubes is selling at 2.25c. to 2.35c. at maker's mill. On the ordinary grades of Iron and Steel Skelp for a firm offer our prices might be slightly shaded by some mills.

Pipes and Tubes.—There is nothing of special interest to report. While demand in the last week of the year was quiet, a considerable improvement is expected in January. The tone of the market is strong, and we continue to quote Merchant Pipe in carload lots at 50 and 10 and 10 per cent. discount, delivered, and in less than carload lots 50 and 10 per cent. f.o.b. maker's mill. We quote Screw and Socket Joint Casing at 37½ per cent.; Inserted Joint, 32½ per cent., with an optional 5 per cent. to dealers. There is a good demand for Boiler Tubes, and prices are very strong. We quote: 1¼-inch and 1½-inch Iron, 40 per cent.; Steel, 40 per cent.; 1¾ to 2½ inch Iron, 50 per cent.; Steel, 55 per cent.; 2¾-inch and larger Iron, 52½ per cent.; Steel, 55 per cent., with an extra 5 per cent. in carloads; less than carloads, f.o.b. maker's mill, Pittsburgh, while carloads are delivered.

Connellsville Coke.— In December the H. C. Frick Coke Company shipped 34,759 cars of Foundry, Furnace and Crushed Coke. Production in the Connellsville region is the heaviest ever known, and for last week, out of 19,709 ovens in the region, 18,868 were active and 841 idle, the output being 202,234 tons. There is not much Coke selling, for the reason that consumers are pretty well covered by contracts. Furnace Coke is quiet at $2.75 to $3 a ton, but small lots for prompt shipment have sold as high as $3.25. Foundry is quiet at $3 to $3.25, but small lots for shipment have sold at $3.50 a ton.

Thomas A. Orr has become a member of the firm of Robinson & Orr, Iron and Steel factors, 421 Wood street, Pittsburgh, Pa. From January 1 the partnership of this concern will consist of J. F. Robinson, Robert A. Orr and Thomas A. Orr.

The partnership heretofore existing between Charles H. Spang, George A. Chalfant and Henry Chalfant, trading under the name of Spang, Chalfant & Co., operating the Etna Iron & Tube Works, at Etna, Pa., with offices in Allegheny, Pa., has been dissolved, and has been succeeded by the firm of Spang, Chalfant & Co., Incorporated, of which George A. Chalfant is president, and Henry Chalfant secretary and treasurer.

Cincinnati. *(By Telegraph.)*

Office of *The Iron Age*, Fifth and Main streets,
CINCINNATI, January 3, 1900.

The last week of 1899 went out with exceeding quietness. The opportunity for relaxations was eagerly grasped by Pig Iron sellers, and save for the unavoidable, but little work was done. Buyers were in evidence only in a retail sort of way and the total amount booked for this district was small. The outlook is for a quiet time for the next two weeks so far as new business goes. Consumption, on the other hand, is keeping up steadily and there seems to be no prospect of an abatement. The call for Pig Iron and Coke is still very strong, and the situation in the last named is very unsatisfactory. Now that the year is closed the claim is made that quite a number of furnaces start in the new year with a large amount of Iron still owing on old year orders. The situation generally is regarded as very strong and at present prices are being firmly maintained. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$21.75
Southern Coke, No. 2	20.75
Southern Coke, No. 3	19.75
Southern Coke, No. 4	19.50
Southern Coke, No. 1 Soft	21.75
Southern Coke, No. 2 Soft	20.75
Southern Coke, Gray Forge	$19.00 to 19.25
Southern Coke, Mottled	19.00 to 19.25
Ohio Silvery, No. 1	30.00
Ohio Silvery, No. 2	29.00
Lake Superior Coke, No. 1	$24.00 to 24.50
Lake Superior Coke, No. 2	23.00 to 23.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, Chilling Grades	$25.75 to $26.25
Standard Southern Car Wheel, No. 2	24.75 to 25.25
Lake Superior Car Wheel and Malleable	25.50 to 26.50

Plates and Bars.— No change in the market of sufficient importance to affect quotations. Trade has been quiet. We quote, f.o.b. Cincinnati: Iron Bars, carload lots, 2.25c., with half extras; small lots, 2.60c., with full extras; Bar Steel, in car lots, 2.50c., with half extras; small lots, 2.95c., with full extras; Iron Bar Angles, 1½ x 3-16 inch and larger, in car lots, 2.65c.; small lots, 2.80c.; Sheets, No. 10, 3c. to 3.15c.; No. 27, Stove Pipe, 3.25c.; No. 27, Steel, 3.35c; Plates, 2.75c. to 3c.

St. Louis. *(By Telegraph.)*

Office of *The Iron Age*, 512 Commercial Building,
ST. LOUIS, January 3, 1900.

Pig Iron.— The market shows no change whatever. Prices are firm and tone of market strong. The trade has every indication that active buying will take place before very long. Inquiries are still light, but from the fill in orders coming to hand it is seen that stocks are being consumed earlier than anticipated. In not a few instances Iron is wanted ahead of deliveries specified on recent contracts. All hands are taking Iron as fast as they can get it. Furnaces do not anticipate any softening in values, but, on the contrary, it is true that advanced prices are expected to be put on some goods which are scarce and hard to get. Contracts entered into for 1900 Ore supply seem to indicate faith in to-day's prices and continuance of good sales. Coke is in constant demand with supplies of Connellsville in somewhat better shape. Railroads have apparently been able to

send more cars into the Coke regions. Some ovens are still oversold, and will not even name prices. We quote on cars St. Louis:

Southern, No. 1 Foundry	$22.25 to $22.50
Southern, No. 2 Foundry	21.50 to 21.75
Southern, No. 3 Foundry	20.25 to 20.50
No. 1 Soft	22.25 to 22.50
No. 2 Soft	21.50 to 21.75
Gray Forge	20.00 to 20.25

Bars.—Conditions in Iron and Steel Bars remain practically the same, but there shows as much, if not more, firmness as at any time during the past 60 days. Mills say they are well supplied with orders, and locally their works could not be shut down during the holiday week for the repairs customary at that time. It is said prices are only made for nearby shipments and at figures ruling to-day. Mills outside the big Iron companies are enjoying heavy business, and we find some unable to book additional orders. Mill quotation on Iron in carload lots is 2.35c., base, half extras, East St. Louis. Jobbers' price also unchanged at 2.75c. to 2.90c., base, full extras. Soft Steel Bars are in good movement, with mill price approximately 2.50c., base, half extras, carload lots, 3c. continues to be the jobbers' price.

Rails and Track Supplies.—Prices remain as last week, with nothing new to mention as to extent of sales. We quote: Splice Bars, Steel, 2.55c.; Iron, 3c. to 3.50c.; Track Bolts, with Square Nuts, are now 3.80c.; with Hexagon Nuts, 3.95c.; Spikes, 2.85c.; Steel Links and Pins, 3.20c.

Pig Lead—Held stiffly at 4.65c. for almost any grade, and principal refiners say they are unable to do anything on spot. Holders say it is worth 4.70c., but cannot show up sales to fix that price. Lead Ore remains at $27.50 per 1000 lbs.

Spelter—Seems to be dull at 4.35c. as a just quotation Smelters paid $36.50 per ton as top for Ore, and while that is a drop of 50c. from last week, the price of Ore and Spelter is at such extremes that smelters are not particularly anxious to enter orders. Ore was expected to follow Spelter, but as very little Ore was in smelters' hands they bought to keep running. Demand is reported as only nominal.

Philadelphia.

Office of *The Iron Age*, Forrest Building,
PHILADELPHIA, PA., January 3, 1900.

Pig Iron.—The market has not opened sufficiently to permit of any very definite opinions, but so far the movements are pretty clearly in the direction of better prices. The first sale reported was 100 tons of No. 2 X Foundry at $25.50. This, of course, is exceptional, but it shows that when good Iron is wanted, buyers have to pay full prices for it. The next fact is that some furnaces are asking buyers to forego a portion of their deliveries that are due them this month in order to accommodate others who are more needy. This does not imply that there is no Iron for sale, but simply that there is a scarcity of brands and of grades that consumers want. There are some Irons for sale at comparatively low figures, but they are not immediately available, neither are they just such Irons as buyers would like to get, but they will find a market in due time, although it may be at prices a little below the regular market, which in a general way is represented by the following figures for seaboard or nearby deliveries: No. 1 X Foundry, $25 to $25.50; No. 2 X Foundry, $23.25 to $24.25; No. 2 Plain, $22.25 to $22.75; Standard Mill Iron, $20.25 to $21; Basic, $22.75 to $23; Bessemer, nominal, $25 to $26, and low Phosphorus, $27 to $28, f.o.b. cars furnace.

Billets.—Sellers are as firm as ever, and as yet nothing has been offered below $37.50 to $38, and it begins to look as though buyers would have to accept these figures or something very close to rock bottom.

Plates.—There is quite a good demand for Plates and some good sized orders have been placed to-day, and late last week. At the decline prices are firm, and manufacturers are beginning to feel that an immense tonnage will be required during the next two or three months, and that even with the increased output there will be plenty of business for everybody. Prices for seaboard or nearby deliveries are about as follows: Steel Plates, ¼-inch and thicker, 2.25c. to 2.60c.; Shell, 2.70c. to 2.80c.; Flange, 3.10c.; Fire Box, 3.30c.; Charcoal Iron Plates, C. H. No. 1, 3c.; Best Flange, 3.50c.; Fire Box, 4c.

Structural Material.—The same feeling as noted in the Plate trade pervades this department also, and prospects for business are regarded very favorably. Prices as last quoted, viz. (seaboard or nearby deliveries): Beams and Channels, 15 inches and under, 2.40c.; Angles, 3 to 6 inches, 2.40c.; Zee Bars, 2.40c., f.o.b. Philadelphia; Angle Bulbs and Deck Beams, 2.63c.; Tees, 2.45c.

Bars.—There is a heavy demand for Bars, and when makers are willing to shade prices 50c. to $1 per ton, they can get all the business they care to take. A few mills have got down very close to 2c. at mill for ordinary Iron, but 2.20c. is the official quotation of the Eastern Association for Refined Iron. Quotations for Philadelphia or nearby deliveries are as follows: Ordinary Iron, 2.10c. to 2.15c.; Refined Iron, 2.20c.; Test Iron, 2.30c.; Steel Bars, 2.50c. to 2.60c.

Sheets.—Business is very quiet, as is usual at this season but prices are maintained at about the same figures as those ruling before Christmas. Prospects for a good demand a little later on are regarded as very encouraging. Prices about as follows for small lots. Best makes are quoted as follows (Common Sheets two-tenths less): No. 10, 2.90c. to 3c.; No. 14, 3.10c.; No. 16, 3.15c.; Nos. 18-20, 3.20c.; Nos. 21-24, 3.30c.; Nos. 26, 37, 3.40c.; No. 28, 3.50c. to 3.60c.

Old Material.—The market is not in a quotable condition at the present time. Buyers are taking advantage of the situation to force a lower level of prices, and for lots that must be sold or moved at a heavy cost they are making some progress. This is probably a temporary condition, and when matters resume their normal conditions, prices will no doubt be much better than they are to-day. There is a wide divergence of views, but the range is about as follows for deliveries in buyers' yards: Choice Railroad Scrap, $22 to $25; No. 1 Yard Scrap, $19 to $20; No. 2 Light Scrap, $13 to $14; Machinery Cast, $17 to $18; Heavy Steel Scrap, $20 to $21; Old Iron Rails, $27 to $29; Old Steel Rails, $21 to $22.50; Wrought Turnings, $15.50 to $15.75; Cast Borings, $14 to $14.50; Old Car Wheels, $20.50 to $22; Iron Axles, $27 to $29; Steel Axles, $28 to $30.

The firm of C. C. Knight & Brother of Philadelphia have been dissolved by the death of Edwin W. Knight, and, from January 1, 1900, Charles C. Knight has associated with himself his son, Joseph S. Knight, and Samuel S. McCormack, under the firm name of C. C. Knight & Co., who will continue the iron and steel business.

The firm of J. W. Hoffman & Co., iron merchants, has been dissolved, Ernest Law being the liquidating partner. The business will be continued at the Harrison Building by Ernest Law, under the firm name of Ernest Law & Co., by whom all contracts are assumed. The new firm will continue the agency for the Lebanon Furnaces, Lebanon, Pa., and by recent appointment will act as the Eastern representative of M. A. Hanna & Co. of Cleveland for the sale of their Ores.

Birmingham.

BIRMINGHAM, ALA., January 1, 1900.

The iron market enters the new year under conditions such as have never heretofore prevailed and expectation is on tiptoe in an endeavor to forecast the future. There are no signs yet of the buying movement which the optimistic element of the trade anticipated would commence this month. The demand the past week was of the same character as that heretofore reported and was not of sufficient magnitude to possess any significance. Quotations are still on the basis of $17.50 for No. 2 Foundry and sales were on that basis. In warrant Iron particularly there seems to be a serious difference between published quotations and actual transactions. No. 2 Foundry warrants were quoted last week at $14.60 and No. 4 Foundry at 75c. less. One party made an effort to buy at quotations and finally received a reply that at $15.50 No. 4 Foundry warrants could probably be had in a limited way. This was very discouraging to a willing buyer. There has been some inquiry on the market for basic iron for delivery all through 1900, but as that grade could not be supplied the demand had no influence. There have been some sales of Steel Billets at $36 at the mill, deliveries commencing in the spring and extending through 1900. There seems to be more pressure for Steel at the moment than for Iron, and if the mill was in position to supply demand sales would be free. It will be probably some time before it will be in full and free operation and things are working smoothly.

The miners this Christmas took an unusually lengthy holiday and the result was that supplies which were close to requirements finally ran short and caused the banking of several furnaces. This will probably in turn affect deliveries, causing delay and breeding dissatisfaction. But it was one of those things that could not be anticipated, and to it can be added the breaking of a blowing engine, which will only add to the difficulties of the situation. At this season of the year accidents and delays are serious matters, as weather conditions are apt to interfere with the "catch up" efforts to nullify them. But they

are all at work now, though production is not yet normal. Two furnaces all ready to go into blast are compelled to remain idle until their Coke supply can be depended upon. The Georgia & Alabama Mining Company, operating in the Cave Spring neighborhood, have increased their ore contracts for delivery here until now they amount to 1600 tons daily to one interest. This illustrates the activity in this one industry, for there is not a mining interest that has any difficulty in placing all the ore they can mine. The same can be said of Coke, whose price now is about 100 per cent. over what it was a year ago.

We have had a run of Steel and Iron magnates among us of late and among them were some who hold important positions with the Carnegie interests. Rumor of course is busy with the object of these visits. But, after stating that they came and made the usual inspection, one has said all that is known. Whatever object these visits may have, it is kept very quiet. Speculation is rife concerning them. The acquisition of the rolling mill property was followed by the abolishment of the offices of president and general manager, at a saving of $10,000 in salary. The mill will simply have a manager in charge as executive officer. The additions to their Steel plant are calculated to add 360 tons daily to their production when everything is going.

Our minor industries all report activity in business. The Hardie-Tynes Company report contract for the motive power of a new cotton will at Pelham, Ga., including a 500 horse power Corliss engine and boilers, while contracts for two large blowing engines for the Republic Iron & Steel Company go to the Birmingham Machine & Foundry Company. These will be the first of their kind ever built in the South and clearly illustrate the progress we are making in the higher and difficult industrial lines.

New York.

Office of *The Iron Age*, 232-238 William street, NEW YORK, January 3, 1900.

Pig Iron.—The market has naturally been very quiet, but for what business is offering is easier. Sellers appear to be willing to make moderate concessions to good buyers. Prices are as follows: Lehigh and Schuylkill Irons, for 1900 delivery, No. 1 Foundry, $24.50 to $25.25; No. 2 X, $23 to $23.75; No. 2 Plain, $22 to $22.50, and Gray Forge, $19.25 to $20. Southern brands are quoted: No. 1 Foundry, $22.75 to $23; No. 2 Foundry, $21.75 to $22; No. 1 Soft, $21.50 to $22; No. 2 Soft, $20.75 to $21; No. 3 Foundry, $21.50 to $21.75, and Gray Forge, $20 to $20.25.

Cast Iron Pipe.—In the Metropolitan district no business of any consequence has been closed. At Philadelphia a contract was placed for local requirements, involving about 10,000 tons. Of this quantity 7000 tons went to a shop in the Central West, and 3000 tons, chiefly small Pipe, to an Eastern plant. Close prices are reported to have been named. We quote $30.50 to $31 per short ton for 6-inch.

Steel Rails.—Some fair sized lots are offering from second hands, at a concession, the quantity involved being about 16,000 tons. The mills report very little new business, and continue the quotation of $35 at mill for Standard Rails. We quote 2.40c. to 2.50c. for Angle Bars, and 2.65c. to 2.75c. for Spikes.

Finished Iron and Steel.—Two moderate sized contracts, involving about 2000 tons, are practically closed. We quote: Beams, 2.40c. to 2.50c.; Angles, 2.40c. to 2.45c.; Universal Mill Plates, 2.65c. to 2.75c.; Tees, 2.40c. to 2.45c.; Channels, 2.40c. to 2.50c.; Steel Plates are 2.45c. to 2.60c. for Tank, 2.65c. to 2.75c. for Shell, 3.00c. to 3.10c. for Flange, 3.15c. to 3.30c. for Fire Box, 3.75c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are 3c. for C. H. No. 1, 3.50c. for Flange, and 4c. for Fire Box, Refined Bars are 2.20c. to 2.25c. and Common Bars are 2c. to 2.10c., on dock. Soft Steel Bars, 2.35c. to 2.45c.; Hoops, 2.70c. to 2.75c., base, delivered.

Merchant Pipe.—Quotations on Merchant Pipe in carloads are 50, 10 and 10 per cent. discount, delivered, and in less than carloads 50 and 10 per cent.,f.o.b. maker's mill. On Casing the figures are: For carload lots, S. and S. Joint, 37½ per cent.; Inserted Joint, 32½ per cent.; for less than carload lots, S. and S. Joint, 32½ per cent., and for Inserted Joint, 27½ per cent., less 5 per cent. to jobbers, the prices for carload lots being delivered and for less than carload lots f.o.b. mill. On Boiler Tubes, 1¾ to 2½ inch, the prices are 55 per cent. off on Steel and 50 per cent. on Iron; for Boiler Tubes, 2¾-inch and larger, 55 per cent. on Steel and 52½ per cent. on Iron, all subject to 5 per cent. on car lots, the prices for carload lots being delivered and on less than carload lots f.o.b. mill.

Rod Mill Wages.—PITTSBURGH, PA., January 3, 1900. —(*By telegraph.*)—The National Association of Rod Mill Workers has presented a scale of wages to the American Steel & Wire Company calling for an increase in present rates of from 3 to 21½ per cent. The men have asked for the restoration of the wages in force prior to 1893 and a uniform scale. The company are given until January 15 to answer and it is not expected there will be any trouble in arranging a satisfactory settlement with the rod mill men.

Metal Market.

Office of *The Iron Age*, 232-238 William street, NEW YORK, January 3, 1900.

Pig Tin.—Ever since our last writing the holiday atmosphere continued to hang over the market. The first two days of the new year showed no signs of activity, and, as a whole, the market is quiet. Tremendous advances in the London market sent the local Tin quotations higher. To-day spot is quoted 25½c. to 26c. London closed £116 2s. 6d. for spot, and £117 5s. for three months' futures. The average price for last year was 27.20c. On January 1 the total visible supply was 2588 tons below that of the year previous, as shown in the following:

	Tons.
Total visible supply January 1, 1900	17,543
Against visible supply December 1, 1899	19,072
Against visible supply January 1, 1899	20,131

Copper.—There is no change in the position of the market. There is no business going through of moment. Values have sagged somewhat, and prices are now quoted as low as 16c. to 16¼c. for Lake. Electrolytic and Casting are quoted 15½c. to 15¾c. London has advanced, and comes at the close to-day £70 2s. 6d. for spot, and £70 5s. for three months' futures. Best Selected has advanced 10 shillings, and is quoted £75 10s. During the month of December the total exportation amounted to 14,836 tons, which is the largest figure for any one month throughout the last five years. The total exports since January 1, 1899, exclusive of Southern ports for December, amounted to 112,022 tons. During the corresponding period in 1898 the exports amounted to 131,237 tons. During the month of December the following arrivals at New York and Baltimore were recorded by the New York Metal Exchange:

	Tons.
From Europe	2,054 Copper.
From Mexico	580 Copper.
From British Columbia	15 Matte.
From Europe	17 Matte.
From Tilt Cove	8,773 Ores.

Throughout the year 1899 prices fluctuated as follows: Lake opened at 13.37½c., which was the lowest point for the year. It closed 16.50c., while the highest point reached during the year was 19.25c. The average price for the year was 17.75c.

Pig Lead.—No change is to be noted in this metal. The market continues firm, and the situation is entirely unchanged. Prices are still 4.70c. to 4.75c. for spot in store here. The price of the American S. & R. Company is unchanged at 4.70c. New York, and 4.65c. St. Louis. London is quoted at £16 7s. 6d. for Soft Spanish. Arrivals at this port during the month of December amounted to 3600 tons from Mexico. Exports in bond to Europe amounted to 6053 tons of 2240 lbs.

Spelter—Is dull and easier. The selling price is 4.50c. to 4.60c. for spot and futures, with very little taken up at these figures. The St. Louis market is quoted easy at 4.35c., and London is quiet, and a little higher at £20 5s. The Ore market is unchanged at $36 per ton for high grades. The production is large. It is said that during the month of December 1472 tons of Ores were exported from this port. The fluctuations in prices during 1899 were as follows: Opening price, 5.10c.; closing, 4.60c.; highest, 7c.; lowest, 5.82½c.

Antimony—Has not been changed, and Cookson's is quoted 10½c. to 11c., while Hallett's prices are 9¾c.

Nickel.—Steady and unchanged at 38c.

Quicksilver.—The wholesale price of flasks of 76½ lbs. is $51. The London cable to-day quoted £9 12s. 6d.

Tin Plate.—Market is without change or feature of interest. The prices quoted by the American T. P. Company are on a basis of $4.84 per box of standard 100-lb. Cokes, f.o.b. New York or 4.65c. f.o.b. mill.

The University of Pennsylvania has just received another gift of $250,000 from the Houston estate. Fifty thousand dollars of this money is to be used for the addition to the university dormitories and the balance as the trustees may decide. J. Vaughan Merrick has presented to the university funds covering the purchase of air pump and jet condenser, indicators, water power engine, milling machinery, alternating current volt and ammeters and other small apparatus for mechanical and electrical engineering laboratory work.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING JANUARY 3, 1900.

Cap'l Issued.		Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday
$29,000,000	Am. Car & Foundry, Common..	5,220	13 -13¾	13 -13¾	-13¾	.....	13¾-14	14 -14¼
29,000,000	Am. Car & F'y, Pref.(7% Non-Cu.)	2,299	58 -58⅝	-57¾	-58¼	.....	59⅛-60⅛	60¾-61
19,000,000	Am. Steel Hoop, Common.....	7,125	40⅛-41⅛	41 -41⅛	41⅛-43	.....	43 -43⅛	43 -45
14,000,000	Am. Steel Hoop, Pref. (7 % Cu.).	1,180	-80	80 -80⅛	-81	.....	82⅛-83	-83
50,000,000	Am. S. & W., Common.....	95,680	45¼-47⅛	46 -48¾	48 -49	.....	48⅝-50¾	48 -50⅛
40,000,000	Am. S. & W., Pref. (7 % Cu.)....	3,980	89¾-90⅝	88¾-90	-89	.....	90 -91⅞	90 -92½
28,000,000	Am. Tin Plate, Common, N. Y..	10,418	26⅞-27¼	27⅛-27⅝	27⅛-28⅛	.....	29 -32	32 -34⅛
18,000,000	Am.Tin Plate, Pref.,N.Y.(7% Cu.)	600	79 -80	79¼-80	.....	.....	-83	.....
7,500,000	Bethlehem Iron†	555	-57⅛	57⅛-57¾	.....	.....	58 -58¼	-58
15,000 000	Beth. Steel, Par $50, $1 paid in.	1,095	-18	-17⅞	.....	.....	-18⅛	-18¼
7,974,550	Cambria Iron, Phila*.....	214	-42¼	43 -44	.....	.....	.....	-44½
16,000,000	Cambria Steel**.....	12,839	19⅞-20¼	20⅛-20¼	20 -20⅜	.....	20¼-21	21 -22⅜
11,000,000	Col. Fuel and Iron.....	21,995	39¾-43¼	42⅝-44¼	44 -44⅛	.....	44¼-45⅞	43¼-46⅛
46,484,300	Federal Steel, Common.....	78,033	49⅞-51¾	50⅝-52¼	52¾-53⅞	.....	54 -55⅛	52¼-55⅛
53,253,500	Federal Steel, Pref. (6 % Non-Cu.)	14,144	72 -73¼	72⅛-74¼	73¾-74¾	.....	74½ -76	73¾-75
32,000,000	National Steel, Common, N. Y..	8,925	41⅛-42⅜	42 -42⅝	42½-43¼	.....	44 -45¼	43½-46¼
27,000,000	Nat'l Steel, Pref., N. Y. (7 % Cu.)	1,750	92 -93	92¾-93	92⅞-93	.....	92⅞-93	-93
5,000,000	Penna., Common, Phila.....	.....	.....	.....	.....	.....	....	.....
1,500,000	Penna., Pref., Phila.....	2	-98	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Common.....	3,250	54⅛-55⅛	54⅛-55⅛	-55⅛	.....	56⅛-58	57½-58
12,500,000	Pressed Steel, Pref. (7 % Non-Cu.)	1,100	85 -86	.....	.....	.....	.....	.....
27,352,000	Republic Iron & Steel, Common.	22,208	19⅛-20⅛	19⅛-20¼	20¼-20¾	... .	21 -23⅜	22 -23¾
20,852,000	Repub. Iron & Steel, Pref. (7% Cu.)	4,040	64⅛-65	65 -65½	....	.....	65¼-67½	67 -68
20,000,000	Tennessee Coal and Iron.....	18,325	82 -84¼	80⅛-83¾	83⅛-84	.....	83⅛-87⅛	84¼-87¾
1,500,000	Warwick Iron & Steel (par $10)	2,010	.....	9¾- 9⅞	- 9⅞	.....	-10	-10¼

* Par $50. ** $1.50 per share paid in. † 6 % guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

Bonded Indebtedness: Am. S. & W., $13,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., $2,000,000 6 % debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., $13,200,000 Illinois 5 % $7,417,000 E. J. E. R. R. 5 %, $1,000,000 Johnson 6 %, $6,732,000 D. & I. R. R. R. 5 %, $1,000,000 2d D. & I. R. R. R. 6 %, $10,000 land grant D. & I. R. R. R. 5 %; National Steel, $2,561,000 6 %; Tennessee C., I. & R. R. Co., $8,867,000 6 %, $1,114,000 7 %, $1,00 ,000 7 % cu pref.; Pennsylvania Steel, $1,000,000 5 % Steelton 1st 1917, $2,00 ,000 5 % Sparrow's Point 1st 1922, $4,000,000 consolidated, both plants; Bethlehem Iron, $1,351,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none. Colorado Fuel & Iron Co.: Col. Fuel Co. Gen. Mort. 6 % $880,000, Col Coal & Iron Con. Mort 6 % $2,810,000, Col. Fuel & Iron Gen. Mort. 5 % $2,303,000. Also outstanding $2,000,000 preferred stock with accumulated dividends of $640,000 to June 30, 1899.

Iron and Industrial Stocks.

The past week has been one of recovery from the decline, until to-day, when the market after first advancing receded quite sharply, many stocks losing a part of the gain on Monday.

	Bid.	Asked.
Otis Elevator, common	23	25
Otis Elevator, preferred	89	92
H. R. Worthington, preferred	107	109
Cramp's Shipyard stock	80	84
Pratt & Whitney, common	3½	5
Pratt & Whitney, preferred	46	54
E. W. Bliss, common	132	...
E. W. Bliss, preferred	125	...
U. S. Projectile	95	100
Barney & Smith Car, common	15	20
Barney & Smith Car, preferred	94	100
International Pump, common	17½	20
International Pump, preferred	64	66
Diamond State Steel	5⅝	5¾
Tidewater Steel	13¾	14
Sloss & Sheffield Steel & Iron, common	31	35
Sloss & Sheffield Steel & Iron, preferred	70	71
National Tube, subscriptions, common	45	46
National Tube, subscriptions, preferred	92	94
American Bicycle Company, common	17	20
American Bicycle Company, preferred	51	60
American Bicycle Company, bonds	93½	...

The question has been asked whether the common stockholders of the American Steel & Wire Company have equal rights with the preferred stockholders. An examination of the charter shows that there is no distinction between the two classes of stock so far as voting rights upon all questions are concerned. The preferred stock is cumulative, and no dividends can be paid on the common until all dividends on the preferred have been paid, but this does not effect the voting rights of the common stock.

The November earnings of the Colorado Fuel & Iron Company were $229,200, as compared with $115,031 in 1898. For the five months ending November 30 the earnings were $803,380, an increase of $447,350, the increase alone being greater than the entire earnings of the same five months in 1898, the total of which was $356,025. Inasmuch as the fixed charges of the company, including bond interest, taxes and preferred stock dividend, are $600,000 for the 12 months ending June 30, 1900, this means that in the first five months of their fiscal year the company have not only earned all these charges, but have a surplus left of over $200,000.

The American Iron & Steel Company of Philadelphia have declared a dividend of 1 2-3 per cent. on their preferred and 50 cents per share on their common stocks. The preferred dividend is payable January 1, and the common dividend is payable January 25.

Fluctuations in Stocks During 1899.

We print below a table showing the fluctuations in iron and steel stocks listed on the New York Stock Exchange for the year 1899.

The figures are given for the highest and the lowest market prices during the year, with the date on which these occurred, together with the total sales.

In a number of cases, of course, the stocks were not listed until well along in the year, so that the transactions do not really cover fully 12 months.

	Range for year 1899.						
Companies.	First.	High.	Date.	Low.	Date.	Last, 1899.	Sales for year 1899.
Am. C. & F. Co.....	21⅛	21⅞	May 25	10⅝	Dec. 22	13¾	152,212
Am. C. & F. Co., pf....	64⅛	68⅝	Sept. 7	51	Dec. 22	58¼	129,423
Am. Steel Hoop Co....	40½	48⅝	Nov. 28	24	May 24	42½	439,295
Am. St'l Hoop Co., pf.	80	86¾	Sept. 14	70	May 13	81	149,326
Am. S. & W. Co. (old)..	48¾	54¼	Jan. 30	38	Jan. 12	49	86,256
Am. S. &W.Co, pf. (old)	120	128	Jan 21	104	Jan. 3	123	37,557
Am. S. & W. Co. (new).	50	72	May 4	32	Dec. 18	48½	4,801,932
Am. S.&W.Co. pf.(new)	96⅛	106¼	Mar. 13	84	Dec. 28	89	530,197
American Tin Plate....	42	52¾	Apr. 4	20	Dec. 11	28½	708,445
Am. Tin Plate, pf.....	95¾	99⅛	Feb. 8	74	Dec. 22	80	75,084
Federal Steel.....	52¼	75	Apr. 3	39¾	Dec 18	53⅛	6,632,692
Federal Steel, pf.....	84½	93⅛	Apr. 3	67	Dec. 22	74¾	1,786,321
National Steel Co.....	52	63	Apr. 24	31¾	Dec. 19	43¼	830,562
National Steel Co . pf..	95	99⅜	Aug. 11	85	May 15	92⅜	147,318
Pressed Steel Car Co...	55	61	Aug. 14	44¾	Jun. 1	55½	329,334
Pressed Steel C. Co., pf.	89	91	Sept. 7	75	Dec. 18	86	74,744
Republic I. & S. Co....	23	33⅜	Sept. 6	16½	Dec 19	20½	318,671
Republic I. & S. Co., pf	74½	79	Aug. 26	60⅜	Dec. 19	65	91,531
Tennessee C. & I...	37½	126	Sept. 11	36	Jan. 9	83⅜	2,556,209
Tennessee C. & I., pf...	111	150	Aug. 22	111	Jan. 4	150	4,172

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street,
NEW YORK, January 3, 1900.

In another column we print the result of the bidding for the equipment of the new machine shop to be built at the Brookly Navy Yard.

H. S. Manning, senior partner of the firm of Manning, Maxwell & Moore, in reviewing the year 1899, said:

"The spring of 1899 filled the machine shops of this country so well that during the greater portion of the year the demand exceeded the supply. This condition continued until about November 1, when there was a perceptible falling off of inquiry. The greatest demand has, of course, been in the smaller sizes of lathes and general machine tools. Demand for this class of machinery was so great in fact that people snapped up anything that was offered, regardless of quality, and many a purchaser went off satisfied with a tool that he would not have allowed into his shop a year ago. The wild clamor was for deliveries. The machines were wanted immediately, and in order to get them many things were overlooked. In order to keep abreast with this demand and really in anticipation of it, we placed many heavy advance orders. In this we were very fortunate, for our large supplies enabled us to meet many urgent inquiries, which in numerous instances included whole manufacturing outfits. To keep up with the existing demand the little tool builders strained every nerve to produce just as much as they possibly could per month, and at this breakneck speed they are still at it. What I am afraid of is that it will be difficult to know where to draw the danger line, and that some day it will be found that pushing has gone too far out into the future. Then we will see in the machine

tool trade what we witnessed in Wall street a short time ago.

"The heavy tool business has always been more steady and conservative, and although it took the boom longer to strike in that market, shops building the heavy machinery are now booked six and nine months, and in some cases almost a year ahead. Take our big steel organizations for instance. All through this activity they have bought scarcely any machine tools. When an order came in to them they placed it with the shop which could best handle it with its present equipment. When things get more easy and business falls off, then we expect them to increase the efficiency of their plant. That is the time when they do their building. Not now, for they have all they can do to get out their work. Our crane business has been enormous in volume. We have doubled the capacity of our works recently, but are now turning down orders because we cannot expect to faithfully live up to the deliveries which are asked. A crane is a special tool. Each must be built according to the requirements of the individual order. Consequently it takes time, especially when the shops are filled before the order is received. Another thing that hampers us in this line is our inability to secure the structural shapes for the trusses, &c. We are giving orders for much of this material without any stipulation as to price. We are paying the market price which rules on the date of delivery. Despite this stiff position which we encounter in securing our materials there are now so many builders of traveling cranes that the competition prevents us from getting the price which we should.

"In our export department we have all that we can attend to. Our Mr. Alfred Brotherhood, who is in charge of that section of our business, is almost distracted because we cannot furnish to him the large tools that he requires. The German market has not been worth much to us. They are the greatest copyists in Europe. They buy a tool for a model and then build it themselves. There are many imitation American tools being sold constantly in Germany. Inferior as they are, they answer the purpose very well, as the extra efficiency of the German mechanics makes up for a great lack of merit in the tool. They get results out of a machine that our men would refuse to handle. We look to Russia as a great field. That country has sent us much business during the last year, and as the country is on the brink of industrial expansion, we look to Russia for a chance for business. Little Norway and Sweden have been buying tremendously of late. They are growing fast in the industrial world. Belgium is also using a great deal of modern machinery, and I think that Italy will soon send us lots of big business. Italy is now just starting to reconstruct her old manufacturing plants, shipyards and railroad shops. England is still far behind. Her shops are full of all kinds of heavy, clumsy, antiquated machinery, and frequently we send big tools to be placed in position alongside of old makeshifts that were built before we were born. They are getting a chance to see what modern machinery looks like since American tools are showing up their old stand-bys. For instance, we recently re-equipped an entire shipbuilding plant over there. Now, as other shipbuilders see the difference, they will be forced to acknowledge the merits of our machinery.

"But the export field is large and we are just beginning to put the foreign manufacturer in line with our methods.

"As for the future, no one can tell. It all depends upon the course of the pig iron market. The trend of the iron mart shapes the course for general business. The present prices of iron must be well maintained for at least six months in order to insure the continuance of business necessary to support the machinery market. The price of steel billets, piping, plates and structural material should also be followed up in order to keep in touch with conditions."

The awarding of the Brooklyn Navy Yard machinery was actually the only feature of real interest in the trade here during the last week. The first three days of the new year felt the same as the last three days of the old and in business there was no difference. Everything was rather slow. Evidently no one had received an order worth reporting, and as for information as to prospective business, every one was too busy looking for the rush to talk.

Of course old 1899 was good all around, but to certain manufacturers it was especially good. Interesting events transpired last year which it might be worth while getting together in order to look at them as a whole.

Doubtless the most interesting event of the year to builders of machine tools was the consolidation of the Niles Tool Works Company, Bement, Miles & Co., the Pond Machine Tool Company and the Philadelphia Engineering Company into the Niles-Bement-Pond Company. This deal was officially consummated in the middle of August, while the details were being worked upon fully two months prior to that time.

As to transactions, the most important of the year was probably the Brooklyn Navy Yard deal. Besides the large lot which have just been decided, various orders were given out all through the summer for equipping the temporary shops. This material really amounted to more than many suppose. The equipping of the German Niles works was also of interest, and right on top of it came the establishment of the German Garvin Company and erection of works in Germany. Other foreign deals which have not yet lost their interest are the three new electrical works being built in England. Dick, Kerr & Co., it will be remembered, came over here and purchased something like $300,000 worth of machinery. The new British Westinghouse plant and the Thomson-Houston shop still require the bulk of their equipment. Another large batch of domestic orders went to fill up the new shops of the Pressed Steel Car Company at McKee's Rocks, Pa. There was about $700,000 worth of this equipment. The Westinghouse Machine Company also bought a large equipment for their new East Pittsburgh shop, and many large tools were purchased by the General Electric Company to augment the equipment for their new machine shop.

The Ingersoll-Sargeant Drill Company were good customers, and they added considerably to their Easton works. Speaking of consolidations, there were two others of importance in the coupling together of the Becker-Brainard milling machine interests, and the meeting of the Diamond Machine Company with the Builders' Iron Foundry, both of Providence. The day of floating the securities had passed, though, when they invaded the machinery lines. Probably the largest to fall through was the proposed combination of crane builders. Other projects that came to naught sought to combine the engine builders, high speed and low speed, the leather belt manufacturers, the boiler builders, foundry facings and supplies, twist drills, blowers and wood split pulleys. In pumping machinery the big fellows formed the International Steam Pump Company, which includes the most important builders.

Birth was practically given to the automobile industry in this country during the last year. Several good sized shops were contracted for, and the work is still going on. In this connection, that big air project, headed by Richard Croker, the Elkins-Widener-Brady syndicate and Messrs. Hoadley & Knight will be recalled. They organized the International Air Power Company and the Auto Truck Company and acquired control of the American Wheelock Engine Company of Worcester, the old Corliss Works of Providence, and the Rhode Island Locomotive Works.

Another large batch of machine tool orders came from Russia, from the Imperial Government, for the equipment of the shops in connection with the Chinese Eastern and Manchurian railways. The year came and passed, but the much talked of Central Railroad of New Jersey machine shops failed to materialize.

For builders of power generating machinery 1899 was an especially active year. Three mammoth power stations were contracted for, to be built in New York City. When last year was ushered in the Metropolitan Traction Company had received much notoriety from their proposed 100,000 horse-power power house. But the year brought with it three similar projects, and all larger and each superseded the other as to size. The Third Avenue R. R. Company were the first in the field. They contracted with the Babcock & Wilcox Company for boilers and the Westinghouse Machine Company for engines. The Manhattan Elevated was next. The Babcock & Wilcox Company received this boiler order also, and the E. P. Allis Company were awarded the contract for the engines. The new Light, Heat & Power Company were the last with their tremendous "Waterside" station. Thayer & Co. received the order for the boilers and the Westinghouse Machine Company will furnish the engines.

In shipbuilding only one large project was brought to issue. It was the New York Shipbuilding Company. Their works are now being erected at Camden, N. J. Orders were placed by the Cramps Ship & Engine Building Company for considerable machinery, among which the pneumatic tool system is of no little importance.

Two large paper mills were contracted for—viz., the Great Northern and that of the West Virginia Pulp & Paper Company.

The effect of the war in South Africa is being felt in the British industries to an increasing extent. So many coal miners having gone to the war, coal is becoming scarce in England and operators have had to advance wages of miners in order to secure fresh hands.

The Chicago and Northwest Machinery Market.

Office of *The Iron Age*, 805 Fisher Building, CHICAGO, December 30, 1899.

The reports made by manufacturers continue exceedingly cheerful. Builders of heavy machinery see no abatement in the demand, their business being still limited only by their capacity. Contracts are being placed for engines of large size with all manufacturers who are in a position to take on more work, while requirements for mining machinery are surprisingly large. Shops handling work of this character have their output under contract far into the future. The demand for small steam engines keeps up well, while manufacturers of gas and gasoline engines are more than satisfied with the manner in which orders are being received by them. In a general way interests connected with power appliances, either for generation or transmission of power, are favored with excellent trade and good prospects. Manufacturers of specialties in the machinery line are also doing well, having ended one year of bounding prosperity and entered upon another which they are confident will be of a similar character. In the machine tool trade, however, some discordant notes are struck. All dealers were not favored with equally good trade in December, and while certain Chicago houses found no reason to complain of their December trade, others were obliged to report marked dullness as compared with previous months. As a falling off is usually expected toward the close of the year, it would perhaps be unwise to draw unfavorable deductions from such a condition of trade, especially as it has not been general. January may bring renewed activity all along the line.

Henry E. Pridmore, manufacturer of molding machines, Chicago, reports that the orders for molding machines, which came in very fast and plentifully during the month of November, have begun to slacken and will not probably pick up until the second or third week in January. The molding machine business is rather a peculiar one in that it takes a great deal more planning and thought before putting in the machines than when a concern wishes to place an additional shaper or lathe in a machine shop. Before ordering a molding machine a manufacturer must know that the patterns which he proposes to put into the machines are to either have a fair run or are to be a standard for some months or a year to come. During the past year Mr. Pridmore received a number of orders for complete equipments of foundries, the largest being the complete equipment of the Aultman, Miller Company, Akron, Ohio, and the complete equipment of the two plants of the Massey-Harris Company, Limited, Toronto and Bradford, Canada, both companies being large manufacturers of harvesting machinery and agricultural implements. Among the cotton machinery manufacturers the demand has been very good. They have always been steady customers for molding machines, and the past year machines have been furnished for the complete equipment of the Draper Company's foundry, Hopedale, Mass., and the Saco & Pettee machine shop foundry, Newton Upper Falls, Mass. Large orders have been sold to single companies in Great Britain, Germany and Sweden, covering manufacturers of agricultural implements, cotton machinery, railroad castings, furnaces, &c. The past year was far better than the previous one, although that was a decided improvement over 1897. The coming year does not promise a great number of large orders, but it is believed that small orders will be more numerous, perhaps enough to make a greater volume of business on the whole than 1899.

The Stover Mfg. Company, Freeport, Ill., say their business for 1899 was about 30 per cent. larger than the previous year and was quite satisfactory in point of character. They have arranged to exhibit their wind mills and grinding mills at Paris, and will also make a display of hardware. Their foreign trade is constantly increasing and they hope to stimulate it largely by means of the proposed exhibit. They have recently inaugurated new prices for their line of wind mills, and from present indications confidently look for a continued large volume of business.

Wickes Bros., Saginaw, Mich., report a steady volume of satisfactory trade in all parts of their business, but no special orders of great note except a sale of 1000 horse-power of their vertical water tube boilers to the Inland Steel Company of Chicago, which are to utilize waste heat from the furnaces. Inquiries and orders are as plentiful as ever and the business done is all on a satisfactory basis. The outlook for next year is excellent, and it is their opinion from a careful survey that the business conditions during 1900 will be much the same as in the latter half of 1899. They have prepared as far as possible for their share of the increased business by doubling the capacity of their boiler plant, increasing their machine shop capacity about 25 per cent. and reorganizing their administrative forces, so that they are in better shape than ever to handle their line of business.

The Adams Company, Dubuque, Iowa, observe that many factories are enlarging their facilities so that more manufactured goods can be turned out in 1900 than in 1899. Many of these improvements are being introduced to turn out the work on orders already placed. They are having at present a special demand for molding machines to be used in the foundry. Their business in 1899 increased 50 per cent. over 1898. They expect 1900 to equal 1899, and see no reason why there should be a falling off in business generally.

The D. Clint Prescott Company, Menominee, Mich., have several months' work ahead of them, running night and day. They have lately been obliged to considerably enlarge their capacity in order to take care of work as it comes in, and contemplate making other and larger improvements next spring. They now have under construction several saw mills, a very large amount of mining work, and some large cut-off machines, which are to go to Sweden for the largest paper company in that country.

The New Doty Mfg. Company, Janesville, Wis., say they have been as busy as usual in December, and have much work ahead. They believe their business in 1899 was fully double that of the previous year, and further believe that in 1900 they will do a still larger business, for which they are making preparations.

The Edward P. Allis Company, Milwaukee, Wis., say that during December the Fairhaven & Westville Railway Company, New Haven, Conn., placed an order for two vertical cross compound direct coupled engines of 1000 horse-power each. These engines are to be added to their present station, which now contains three Allis horizontal cross compound engines. The Deering Harvester Company, Chicago, have ordered the third Allis vertical cross compound engine of 1800 horse-power. About the usual number of orders for small engines have been received. The business obtainable is still only limited to their capacity, and they expect a continuance of the present conditions for some time into the future.

The Chicago Pneumatic Tool Company, Chicago, say their sales of pneumatic tools for the year just closed have been very great, in fact phenomenal. The trade at this time shows every indication of being on a permanent basis, their December orders having been far in advance of December, 1898. Their business for 1899 was probably three times as great as in the preceding year, and they expect a still further increase in the coming year. They are arranging for a very complete exhibit at the Paris Exposition, where they will show a full line of pneumatic appliances of all kinds and will make a special exhibit of their pneumatic riveters as applied to shipbuilding. During the past year they have equipped all the United States navy yards and all the principal shipyards of this country with their pneumatic riveters and other tools, and are now beginning to receive returns in the way of orders from the special exhibition outfit which they sent to the English shipyards during the past season. The demand for pneumatic appliances is world wide. They have made large shipments to all the European countries, as also to South Africa, Australia, South America, China and Japan. They are just filling an order for a large air compressor and a complete outfit of pneumatic tools for a shipyard at Kobe, Japan, which indicates that the countries of the far East are alive to the labor saving appliances produced in this country.

The Gates Iron Works, Chicago, say there has been no interruption in the receipt of large orders during the month of December. Like every other month of the year it has been a record breaker for the month of December. The increase in 1899 over 1898 is nearly 47 per cent. The amount of orders on hand at this time is more than four times as large in volume as the amount in hand at the same time last year.

The Whiting Foundry Equipment Company, Harvey, Ill., report the volume of business exceedingly satisfactory. They have taken some very large contracts for special machinery. Recent additions to their plant consist in installing two large boilers, enlargement of boiler and engine house, extending the equipment shop with an addition of 90 x 70 feet, and these improvements, in connection with several new machines recently purchased, put them in good shape to increase their capacity considerably. The business of 1899 was about 40 per cent. better than 1898. They expect plenty of busi-

ness for the coming year, providing there are no bad results from the recent depression of stocks.

The Nordberg Mfg. Company, Milwaukee, Wis., say that the condition of the machinery trade at present is still one of "over activity," meaning by this that the demand for all sorts of machinery is in excess of the facilities for supplying it. It is difficult to state the increase of their business during 1899 over that of 1898, since for four years they have been running to their limit. The increased value of their product is due very largely to the increase in price, which represents fully 40 per cent., if not 50 per cent., of the prices ruling in 1898. Since, to the best of their belief, nearly every shop is filled with orders to cover the year 1900, no particular change can be looked for. The war in South Africa, and the consequent lessening of the gold production to the extent of nearly $100,000,000 a year, and the Presidential campaign next summer undoubtedly will have some unfavorable effect.

The Dodge Mfg. Company, Mishawaka, Ind., say that 1899 represented an increase of 65 to 70 per cent. in their general business. Their foundry and machine shop facilities, also their wood working or pulley department, have been accordingly increased to meet the demand, as there has been no time in the past few years that they have not been quite up to their capacity in general manufacture, and the increased business of the past year has only been made by increasing facilities. They are now melting on an average 28 tons per day in their foundry and have more orders on their books than ever before in their history. They see no reason why 1900 should not be fully up to 1899 and anticipate a substantial increase, although there are many conditions which may operate toward reducing the general trade volume for that year on account of its being campaign year. They are just installing a 500 horse-power boiler, which now gives them a steam plant of 1500 horse-power. They have a complete installation of air compressing machinery and appliances requiring the use of compressed air throughout their works, and have extended their electric plant and heating. Among new constructions which they put in this year is an iron section in their machine shop for a 25-ton crane. A number of new and special machines have also been added. They have recently installed a 3000 barrel cement plant for the Iola Portland Cement Company of Iola, Kans., and have furnished the Michigan Portland Cement Company of Coldwater and Quincy complete outfits for both of their plants, which are probably as large as any others of similar character in this country. They have furnished over a dozen equipments for the manufacture of Portland cement during the past few months, and have also furnished a large amount of rope transmission machinery for Southern cotton mills, and in addition to this some complete mill equipments composed of shafting, hangers, iron-center wood-rim pulleys, &c. They have established a general agency for their entire line in Mexico with large stocks in store, and have also opened a Southern branch office at Atlanta, Ga., for taking care of their rapidly increasing southeastern business. Their export business is probably 200 per cent. higher than any previous year, and they are now furnishing goods to nearly every country on the face of the globe where machinery is used.

The S. Freeman & Sons Mfg. Company, Racine, Wis., have during the past month entered some very large orders, among them being 16 72 inch by 18 foot boilers for a saw mill being erected in the South; six 72 inch by 18 foot boilers for a gold mine in Utah; two 72 inch by 18 foot boilers for a cotton mill near New Orleans, La. They have entered an order for some large tanks for shipment to Spain, also for a large marine boiler for a boat navigating the Columbia and Snake rivers in Oregon and Washington, besides many orders for smaller sized boilers from all parts of the country. At present they are booked ahead with about all they can do in the boiler line until April 1. Their implement department is also crowded to its fullest capacity, having sold more broadcast seeders up to date than in any previous year. They estimate that their business for 1899 increased over that of 1898 by 60 per cent., and it looks as though the year 1900 would show an improvement over 1899.

The Vilter Mfg. Company, Milwaukee, Wis., have found business exceedingly good the past month, the trade in Corliss engines being heavy. They are running two shifts of men day and night. The past year has been their banner year, their business having been half as much again as that in 1898. The outlook for the spring trade is promising, particularly on ice machines. They have taken orders recently as follows: Cudahy Packing Company, Kansas City, Mo., three 200-ton refrigerating machines with tandem compound engines, also two 40-ton ice tanks (second order); International Packing Company, Sioux City, Iowa, three 100-ton refrigerating machines driven each by a compound Corliss engine, also direct expansion piping for the complete plant; other orders for refrigerating plants from 115 to 25 tons from various parts of this country and some for export to Cuba and Mexico; orders for Corliss engines have come from various sections of the United States.

A. Sorge Jr. & Co., Chicago, report a continuous increase in the demand for feed-water heaters and separators, and they are keeping the factory filled up with work. Among the larger contracts placed during December they mention one of 10,000 horse-power Cochrane feed-water heaters and purifiers ordered by the American Steel & Wire Company for their plant at Waukegan, Ill.; one 3000 horse-power heater and purifier with the Sorge chemical purifying system for the South Chicago Furnace Company, at Irondale, Ill.; one 1000 horse-power heater and purifier for Deere & Co., at Moline, Ill., besides a number of smaller installations. The business done in the Cochrane heaters and separators during the year 1899 was from four to five times that done during the year 1898. For the year 1900 they anticipate doubling the business of 1899, as all indications are favorable.

The Hoefer Mfg. Company, formerly Stover Novelty Works, Freeport, Ill., report that their business for 1899 a little more than doubled and as yet they have not seen any indications of decrease. The last year has been one of special interest and credit to them, as they made a number of special machines that other firms were unwilling to undertake. The first machine was a wire loom, of which they made four and which proved a success. Another large machine was a 10-spindle drill and another was a 16-spindle boring machine. The drill had a range of 14 feet between centers of outside drills and the boring machine had a range of 12 feet between centers of outside spindles. These machines are adjustable and can be arranged for any length desired. They have also brought out a new 20-inch drill and a new 22½-inch shop drill. It has been nothing uncommon for them to have from 6 to 18 different special machines under way all the time. Inquiries and orders have come in not only from this country, but also from foreign countries. They have within the past two weeks received large orders of machinery from Buenos Ayres, Argentine; Chaux-de-Fonds, Switzerland; Copenhagen, Denmark; London, Eng.; Dresden, Germany; Amsterdam, Netherlands; Dusseldorf, Germany. They have now orders on their books that will keep them very busy for the next three or four months. They are somewhat undecided as to the Paris Exposition, but their foreign agents are expected to take care of them there.

The Fred W. Wolf Company, Chicago, say that although ice and beet sugar machinery contracts have been coming in rather slowly during the past month, a great many live prospects are ahead, and they expect a repetition of the successful business they enjoyed during 1899. Their business last year more than doubled that of previous years, and they feel confident the coming year will also show an increase if contractors are able to receive building material in time for the fall campaign, especially in the sugar works. It takes several months after securing an order to receive the structural iron needed, and this has a great tendency to hold off the beet sugar promoters, as a great many of them fear that by placing contracts now they will be unable to be prepared for the next year's crop. They have just completed a shipment of 10 85-ton ice machines to Australia, this being the largest order for ice machines ever shipped into that country. They are also about to ship a large ice plant to Merida, Yucatan, and at this time are just completing a 25-ton ice plant in Manila, P. I. Their facilities for competing with like concerns are now far superior to those enjoyed heretofore, as they have recently completed an immense new factory, which will more than double the capacity of their former works.

The M. C. Bullock Mfg. Company, Chicago, say the year just closed has seen a marked increase in all lines of their business, the month of December being the busiest of all. They have just closed an order for a hoisting plant for the Loretto Iron Company and another for the Spruce Mining Company, and have shipped a compressor plant to old Mexico and another to the Black Hills, a diamond drill to a mining camp near Kootenay, and three loads of engines and machinery to Australia. They have five hoisting plants and several Willans and Corliss engines going through their works. They will make an exhibit at the Paris Exposition, which will consist chiefly of diamond drills.

The Witte Iron Works Company, Kansas City, Mo., have enough contracts now for gasoline engines to run them far into the summer, to say nothing of the fact that they have not one engine on hand unsold. The increase of their business in 1899 over that of 1898 has been fully 100 per cent., and they have no doubt whatever that a larger increase will be made in 1900. They say that trade generally in their line is at a feverish point. Or-

ders come and must be filled and price cuts no figure. So far as they can see the next Presidential election will pass over without any effect whatever on trade. It would possibly do the country a little good to slack up a little, as we are getting entirely too much of a good thing, and the rebound may hurt us.

The Armstrong Bros. Tool Company, Chicago, say the most notable feature about their business during the month of December was the fact that they did not experience the falling off in business which is usual at that time of the year, orders coming in quite as freely at the end of the month as at any time during the season. They have arranged to make an exhibit of their tools at the Paris Exposition which will be a very complete exhibit and one which they think cannot fail to attract attention. The exhibit will be in charge of Markt & Co., who are their agents at Paris.

The Standard Pneumatic Tool Company, Chicago, say that the year which just came to a close has been one of their most successful years, they having sold $250,000 worth of Little Giant pneumatic tools in this country and in Europe, and have on hand a large number of orders for tools to be shipped to all parts of the world. Their business has been 40 per cent. better than in 1898. They have established works in Chippenham, Wilts, England, for the manufacture of their pneumatic tools for disposition in Great Britain only, the source of supply for all other foreign countries being their Chicago works, which have recently been enlarged. Their exhibit at the Paris Exposition will consist of a complete working air plant in Vincennes, showing their Little Giant pneumatic drills, boring machines, hammers, flue rolling, reaming and tapping machines, riveters, motor chain hoists, &c., in actual operation at all times. They will also have space in the Champ de Mars, where all their tools will be shown, but not in operation. They expect to have a very good exhibit and hope to derive considerable benefit from it. They enter the new year with bright prospects and are confident that they will make it the banner year.

The Gardner Governor Company, Quincy, Ill., say their December business kept up remarkably well and in comparison with previous years is far ahead of the business done in the same month. Both governor and pump departments have plenty of work ahead of them, and the company confidently expect a continuation of the prosperous times that have prevailed the past year. Among the noteworthy contracts taken recently have been duplicate export orders which are naturally very pleasing. Their business as a whole during 1899 was from 50 to 75 per cent. greater than that done in 1898.

The Fox Machine Company, Grand Rapids, Mich., report a very satisfactory increase in trade on both their iron-working and wood-working tools, as well as on their all steel sash pulleys, but the demand for bicycle tool machinery has been very light the past year. They have brought out new machines as follows: In wood trimmers the No. 5 A is a new size, while Nos. 6 F and 8 F are also recent tools, the latter being the largest wood trimmer made. The high speed multiple spindle drills, with 1, 3 and 6 spindles, and the No. 2 pilot wheel hand milling machine are very recent productions, the latest thing in this line being the No. 3 milling machine, which is the same tool as the No. 2, but with a power feed to the carriage. A new No. 5 pipe or heavy tube cutting machine was recently placed on the market, this tool following out the same principles employed in their bicycle tube cutting machine, except that it is much heavier and built to withstand the heavy pressure necessary for cutting iron piping, &c., the machine itself, however, being very simple. They enjoyed a very nice export business last year.

Perry Ransom, Oshkosh, Wis., reports the past year the best since 1891. More orders are now booked and less stock is on hand ready for immediate delivery than at any time before. Arrangements have been made with Adolph Janssens to exhibit some of the Ransom tools at the Paris Exposition. More orders have been coming in of late from European dealers than heretofore and a good business is expected during the coming year.

The National Steel Company.

W. H. Baldwin, secretary of the National Steel Company, reviews the situation as follows: In common with others we experienced an unprecedented demand with a pressure for shipments which could not be adequately satisfied, and a consequent rise in prices beyond any which we ever expected to see. The operations during the year were for some time hampered by the difficulties consequent upon this unusual pressure of business, but in spite of these our output was large. Toward the close of the year the urgency of the demand for steel was somewhat diminished, particularly for prompt steel, and for a time the trade was rather quiet, with a suggestion of possibly lower prices.

This suggestion was met by the fact that nearly all, if not all, of the pig metal available for the next six months has been sold at practically the highest prices, and that prices of ore, coke and everything entering into the manufacture of steel have been fixed on a basis which makes the present prices not unreasonable. A recognition of these facts has produced a feeling of greater confidence in buyers, within the last two or three weeks, which has resulted in the sale of considerable steel without reduction in price. All in all a large tonnage for next year has been taken, and we believe that the outlook for a large volume of business, with practically steady prices in all lines, is good.

PERSONAL.

J. W. Exler, formerly superintendent of the Enterprise Boiler Company, Youngstown, Ohio, has been appointed superintendent of the Pittsburgh department of the Pressed Steel Car Company.

F. C. Smink has become vice-president and general manager, Simon Seyfert managing director and George B. Harris treasurer of the Reading Iron Company of Reading, Pa.

J. W. Hoffman of J. W. Hoffman & Co., iron merchants, Philadelphia, has retired from the firm to give his entire time and attention to the Hoffman Engineering & Contracting Company as their president.

Stephen C. Millett has taken personal supervision of the investment department of Tracy & Co., bankers, New York.

At a meeting of the directors of the Patent Nut & Bolt Company, Limited, London Works, near Birmingham, E. Windsor Richards of Caerleon, Mon., past president of the Institution of Mechanical Engineers and of the Iron and Steel Institute, was unanimously elected to a seat on the board.

Jesse Lewisohn of Lewisohn Brothers, metal merchants, New York, has recently returned from Europe.

R. Baïulesco, who is engineer-in-chief of the Roumanian State railroads, is now in this country. He intends to study our transportation facilities and look into the capacity of American steel works and bridge plants to produce material for the Roumanian lines.

Andrew Carnegie has made a New Year's gift of $300,000 to Cooper Union, New York, for the endowment of a mechanics' art high school. The fund has been further increased by the Cooper and the Hewitt families to $500,000, about $2,000,000 having been given until now. A day school devoted to technical education in the mechanic arts will be established, thereby completing the scheme of instruction for the working classes contemplated by Peter Cooper, the founder of Cooper Union.

E. C. Seaman has been elected secretary of the Iron Clad Mfg. Company of New York, vice E. H. Kinney, who recently resigned.

James M. Crafts, president of the Massachusetts Institute of Technology, has sent in his resignation, to take effect at the close of the present academic year.

Robert T. E. Lozier of the Bullock Electric Mfg. Company, Cincinnati, Ohio, has just returned from a trip to England, from whence he brought a large number of orders for his firm's electrical machinery.

D. G. Kerr, superintendent of the Edgar Thomson blast furnaces at Bessemer, Pa., has been appointed assistant to James Gayley, who is a member of the Board of Managers, and Mr. Kerr will hereafter have his headquarters in the general offices, Carnegie Building, Pittsburgh. In honor of his promotion Mr. Kerr was presented on Monday night by the heads of the various departments at the Edgar Thomson furnaces with a pair of diamond cuff buttons, set of gold shirt studs and a gold watch, chain and charm. Mr. Kerr has been succeeded as superintendent of the Edgar Thomson furnaces by G. G. G. Crawford, formerly superintendent of the Monongahela blast furnaces of the National Tube Company at McKeesport, Pa.

F. M. Rapley has been appointed general European agent of the Pressed Steel Car Company, with headquarters in London.

The Executive Committee of the National Anti-Trust League have made arrangements for holding a convention in Central Music Hall, Chicago, February 12. This organization is an outgrowth of the convention held in Chicago some months since for the purpose of discussing the subject of trusts. A considerable element was dissatisfied at that time because a declaration of war against trusts was not adopted.

HARDWARE.

The Hardware Market in 1899.

THE past year was in some respects the most memorable in the history of the trade. The large advances in the prices of many lines of goods and the strength of the market as a whole, together with the heavy demand and the general activity in business, furnished a striking contrast to the long continued downward trend of prices which had characterized the market for so many years and the comparative sluggishness of business during the depression, from which there had been a gradual but rather slow recovery. In the past year this was all somewhat suddenly and abruptly changed, for while there were reasons to anticipate much improved conditions, very few had the foresight to recognize in advance the change in values which was to take place and the year's great volume of trade.

COURSE OF PRICES.—In the following columns we enter with some detail into a review of the course of the market on some prominent lines. It is obviously neither feasible nor desirable to attempt to cover in such a retrospect all the diversified lines which come under the head of Hardware, but those referred to are among the most important and may be taken as representative of the whole field. It will be seen that there is a wide difference in the extent of the advances which have been made, some goods feeling much more directly than others the influence of the high prices for the raw material. The effect of combinations also is evident in doing much toward forcing prices upward and in maintaining them. In a good many lines the advances have been comparatively insignificant, the manufacturers in such cases regarding it as better in the long run to avoid putting up prices, deeming it likely that there will be a return to low values before long. The apprehension that the advance of prices would tend to encourage competition and make the state of the market ultimately more unsatisfactory than it has been has also influenced conservative manufacturers. In some lines, too, the inability of manufacturers to act together, owing to the stress of competition or special circumstances, has done much in preventing advances.

THE DEMAND.—At the beginning of the year manufacturers in many lines had booked liberal but not extraodinarily heavy orders from the larger trade. Jobbers were very prompt to recognize the fact that prices were likely to go materially higher, and accordingly, with the first indications of improvement, enlarged their orders and thus secured great quantities of goods. With the rise in prices this buying was with many of them continued, and during the greater part of the year stocks in the jobbers' hands were very much larger than usual. The retail trade, however, purchased freely under the stimulus of the advancing market, adding to their stocks with more courage than for a good many years. Their local trade also was in most cases excellent and goods moved freely from their shelves and warehouses. At the present time their stocks are undoubtedly liberal, but business is in good volume.

THE JOBBERS' YEAR.—The year has been a good one for all classes of trade, but it is probable that the largest harvest of profit has been reaped by the jobbing trade, whose position as above referred to was such as to enable them to dispose of their large stocks at much broader margins of profit than has usually been the case. With the manufacturers conditions have been quite different. In some instances, where exceedingly high prices have been maintained by means of combinations or consolidations, there is no doubt that great profits have been made. In a good many lines, however, the manufacturers found their books filled with orders at low prices and of such extent that a good part of the year was occupied in executing them. Such orders, if the manufacturers were duly covered on the raw material, yielded at best but an ordinary profit and kept them from availing themselves of the opportunities which the market would otherwise have afforded them. Unfortunately, however, the manufacturers had not in all cases contracted for the necessary raw material and many of them did a large volume of business at an actual loss. The promptness with which the jobbers placed orders after some moderate advances had been made kept manufacturers in many lines busy throughout the year in filling orders at lower prices than they were then quoting. With the retailers the condition has been quite different. In a great many cases they have been very slow about advancing their selling prices, very often continuing to sell goods without marking them up in sympathy with the higher market prices.

COMBINATIONS AND CONSOLIDATIONS.—A marked feature of the trade during the year has been the great number of consolidations which have been effected in the Iron and Hardware lines. The extraordinary growth in the organization of companies in which the interests of many manufacturers are united has been recorded in our columns, and the influences of such unifying of interests have been most important on the market at large. Besides the great consolidations relating principally to the raw materials or the cruder products of the Iron trade, with which this portion of the year's retrospect does not deal, there have been in strictly Hardware lines many consolidations effected and combinations of one kind or another formed which have had much influence on the course of prices, and, in some respects, on the general conditions of business. The trade are familiar from their experience in past years with combinations, pools, or other more or less rigid agreements of manufacturers, but it is safe to say that never before were there so many of these organizations controlling or attempting to control the prices and production of Hardware articles. These combinations have not in all cases used their power in establishing extremely high prices, but on certain lines they have been influential in this direction. The question as to their permanency and the methods which they may adopt in the endeavor to continue their control of the market obviously have an important bearing on the future course of trade. In connection with such combinations there has also been a departure from some methods of transacting business previously in vogue and the changes thus effected have important bearings on the general interests of the trade.

ASSOCIATIONS OF HARDWARE MERCHANTS.—There continued to be throughout the year much activity among merchants, both wholesale and retail, in forming organizations for the advancement of their interests, and in both classes of trade such movements have been attended with a good measure of success.

Organizations of Retail Merchants.—Several new State associations have been started during the year, and some of the older ones have shown a marked growth in membership and activity. The influence of these associations is becoming more and more evident, and they are beginning to be recognized as a power which has to be taken into account by manufacturers and jobbers in determining the policy to be pursued in regard to cer-

tain trade questions and practices in which the retail merchants are interested. Some progress has certainly been made in the opposition to department stores and in preventing interference by manufacturers or merchants with trade which retail merchants consider as belonging to them.

National Hardware Association.—The past year has made more evident than before the power of this great organization, and much has been accomplished for the advancement of the jobbers' interests by means of its persistent and intelligent activity. In addition to what it accomplished among its members looking to the prevention of cutting and the maintenance of regular prices —in which it has been in some measure successful— the association has done a most important work, so far as its interests are concerned, in inducing manufacturers to adopt prices for their goods which are advantageous to the jobbing trade. They have emphasized what they regard as the correct principle that the jobber should be the channel through which goods are distributed to the retail merchant, and they have accordingly held many conferences with manufacturers to induce them to make their method of quoting and their scheme of prices such as to be in the interest of the jobbers, and secure to them not only adequate profits, but also a large part of the trade which was formerly transacted directly between the retailers and manufacturers. In this connection it is to be noted that nearly all the pools, combinations or consolidations have shown a marked consideration for the jobbers' interests and have endeavored to guard them, even at the expense of the larger retailers.

Classified Lists of Merchants.—One of the methods which has come into more general use than before is the classification of the trade according to the extent of business transacted and the grade of prices to which they are entitled, a marked difference being made by combinations above referred to in the quotations to the different classes. Under the operation of this plan it has become a much more difficult matter than heretofore for houses not thus advantageously classified to obtain nearly as relatively close prices as used to be the case. This is a feature of the situation which is obviously very satisfactory to the houses who are on such favored or preferred lists, but bears disadvantageously on smaller jobbers, and the larger and more enterprising retailers, who have been accustomed to buy at prices closely approximating those at which the large trade have purchased. Quantity discounts are, to a certain extent, also resorted to in some cases to accomplish the same end.

Net Cash Terms.—The shortening of terms of payment and the diminution or abolition of the cash discount is one of the features which has characterized the last year's trade. There has been, however, much opposition to the change on the part of the jobbers, and it remains to be seen whether or not it will be found desirable to adhere to the policy thus inaugurated.

Export Trade.—The export trade in manufactured goods, contrary to common impression, has proved exceptionally good, as prominent exporters anticipated a shrinkage in volume owing to higher prices, but on account of advances in Europe on metals, &c., this fear has not been realized. European mills full of orders have steadily pushed up prices, while some exporters here frankly say American manufacturers have taken good care of the export trade. An instance is mentioned of a certain commodity of great importance which we have never been able to send out, but which in December last we commenced to export in a large way. There are some exceptions, however, to this view among exporters, who charge makers here with unwarrantably raising prices beyond a parity with competing goods manufactured in Europe. Exporters look for an excellent foreign business in 1900, all indications pointing to a marked increase in the kinds and quantities of Hardware products which will be sent abroad.

Condition of Trade.

The market opens with practically the same conditions as were described in our last review. Further advances in Wire Nails and Barb and Plain Wire are to be noted. The special conditions prevailing in the different markets are referred to in the following special advices.

Chicago.

(By Telegraph.)

The movement of Shelf Hardware is in excess of what might be expected with so many traveling salesmen now at home. Business from present indications will be larger as soon as jobbers' representatives are again on the road in full force and the inventory season is ended throughout the country. Prospects are exceedingly bright. Advancing prices are not checking trade, orders continuing to come in subject to market rates. The event of the week is an advance on Wire Nails and Wire of 25 cents per 100 pounds, which is much heavier than had been anticipated. Iron Planes have also been advanced 10 to 20 per cent. The Screw list has been changed, a readjustment of the various sizes having been made which makes an average advance of about 5 per cent.

St. Louis.

(By Telegraph.)

Inventory days have permitted no dullness, and coupled with the unusual sales for this season, jobbers have had hard work keeping up with current demands. Traveling salesmen met in the past few days report outlook for continued good trade as excellent and affairs in their various districts in very good shape. The most interesting event and which seemed to have come at a time when few jobbers had contracts on hand with mills was the advance of 25 cents per keg on Wire Nails, and an equal advance of $5 per net ton on all Wire Goods. Other changes are in prospect and new quotations may be expected on sundry items during the next few weeks. The Heavy Hardware trade reports business satisfactory, considering the season. Some withdrawals of prices have been made, notably on Enameled Goods for carriages.

Boston.

Bigelow & Dowse Company.—The closing of the year 1899 marks an epoch from which we can consider the past and look forward to the future.

Never before in the annals of the Iron, Steel and Hardware trade have the values changed so rapidly and materially. Never before have the mills and factories been so crowded beyond their capacity to fill orders. Starting from the lowest prices of one year ago, the base material in many cases has advanced over 100 per cent.

Manufacturers have been slow to make advances in proportion to the advanced cost of Steel and Iron, but it is a fair estimate that general stocks of Hardware are increased in value 25 to 33 1-3 per cent. over that of one year ago.

Trusts, combinations and corporations have been formed controlling great interests with fabulous capital. Their power to control the price and the sale of their products is indisputable.

Thus far they have shown a commendable disposition and have freely acknowledged their policy as manufacturers to distribute their products through the dealers and thus have gained the dealers' hearty support.

These conditions of concerted action and support between the manufacturers and the dealers have been encouraged and brought about by the good work done by the National Hardware Association, whose effort has been to convince the manufacturer that his province is manufacturing, the jobber's is distributing and the retail dealer's is supplying the consumer.

To-day two great powers stand forth in friendly array: The manufacturers and the National Association of

Jobbers. Both have millions of capital for their support. One cannot succeed without the other. United we stand, divided we fall. The results of these friendly feelings have brought rich returns to all. Let us hope they will long continue.

Looking forward to the future we must face new conditions and new possibilities. It was a jolly, easy road to follow when the buyer could not enter too large contracts for delivery at any old time, however far distant. When our principal occupation has been marking up prices and our customers, imbued with this same spirit, have been buying freely.

Is it not a good time at present to consider how long these easy times are to continue, and ask ourselves the question, if prices have not reached their highest limit?

Judging by past experience we should say it was time to expect danger, but the new conditions force the belief that prices will be maintained and may even rule higher for some time to come.

To-day we received a circular from a manufacturer saying he had continued to supply goods at old prices while his old stock of material lasted, but now that he was compelled to renew his stock at advanced prices he was forced to add this extra cost to the selling price.

How many manufacturers are in this same condition?

How many lines have advanced the full cost of the raw material? It is general opinion that most manufacturers must now purchase Steel, &c., to continue their work.

Is it possible, after supplying the trade with all their material bought at old prices, that now, when they are forced to replenish their stock at new prices, they will immediately make a reduction in case a lower price was made on the metal itself? Increased wages is a factor that increases the cost.

Another consideration as to the maintenance of prices is the combinations who control them. At other times, when the competition was great and the supply was unlimited, there was a disposition for each factory to care for itself. To-day these factories are merged in one and under one control.

What man is so insane as to believe lower prices will promote freer buying? It must be sure to cut it short.

The present condition of most of the large dealers is they have large speculative stocks and the manufacturers must wait a bit before they can expect a return of orders, except as these stocks are depleted. While present conditions exist the holders of stocks of Hardware should have no wish to sell at less than manufacturers' prices, lest they themselves should bring about the chaos that might ensue, for no man must be conceited enough to believe that he is the only pebble on the beach, and that his stock is so much larger than that of any other fellow. Every merchant makes more money on a high range than on a low range of prices. Sales double, profits increase, and the percentage of cost of doing business is reduced.

Wishing *The Iron Age* a happy New Year, and with congratulations for the good work done for the manufacturer, the jobber and the retailer in the past, we hope you will continue your good work that they may all be the same happy and contented family in the future as they are to-day.

New Orleans.

A. Baldwin & Co.—The general business shows a slight falling off at the close of the year, but it has been remarkably active during the past four months. The movement of product has been much larger than any year during the last ten; it is even in excess of 1892.

While some of the advances of product have been phenomenal and have curtailed the output in these few lines to a certain extent, the enormous demand for other lines of Hardware has more than offset the slight falling off in the demand for these extraordinarily high priced goods.

After making a liberal allowance for the advances in product, the business of 1899 is more than double the output in either of the past two years. The increased prices that the farmers in this section have obtained for their product have enabled them to wipe out considerable of the old indebtedness, and all lines of trade have felt the beneficial effects. They have been buying more liberally and are not apt to scrutinize too particularly the advanced prices that product is bringing at the present time.

Altogether it has been one of the most satisfactory years in the business of this section of the country.

Louisville.

W. B. Belknap & Co.—The period of quiet incident to stock taking and holiday observances has prevailed this year and the decline in sales, particularly of heavy goods, has been quite marked. This was only to be expected after the unusual activity of nearly 12 months when every customer has been pushing for his material. The soundings of the country at large and the general prosperity will, we are sure, call for freer supplies of new goods as soon as the new year resolutions have a chance to work. At the same time the buying will be cautious, and nothing taken hold of speculatively, as in the case when handsome advances were plainly to be forecast. The main effort now, on the part of manufacturers, we imagine, will be to sustain prices where they are. In event of a decline in the consumption, just what part in this process of price maintenance is to be played by the large combinations, so-called trusts, will be extremely interesting to the student of political economy.

The most mature, well conceived article on the subject of trusts and how far they may be regulated, that has fallen under our notice, is that of Mr. Clark in the *Atlantic Monthly* for January. He dismisses as impracticable much of the attempted regulation of these large business organizations, but he is sure that the temper of the people will forbid anything like restricted production—that is, cutting off sources of production with a view to artificially maintaining or advancing prices. His belief is that this country is bound to be the great Iron and Steel producing country of the world, and this cannot be if by combination mills may be closed at will, large numbers of people thrown out of employment, and prices upheld above the export point, or in the home market at such a point that the manufacture of more highly finished articles is prohibited or restricted. If on the finished goods there were not that competition with the foreign markets which afforded us so much relief a few years ago and gave promise of much greater things in future, we should be going backward. The closing down, for instance, of a Wire mill in a town the size of New Castle, Pa., is a serious matter in a community of a large number of wage earners who have gone there with the prospect of employment at least when there is a demand for the product such as at present. This much regulation by legal enactment, Mr. Clark thinks, will be made legitimate and insisted on by public sentiment.

Cleveland.

The W. Bingham Company.—Eighteen hundred and ninety-nine is of the past. Nineteen hundred, beginning of the Twentieth Century, is upon us, and brings with it the thought, Will the new century be as fraught with changes to civilization as has been the past? It would hardly seem probable, and yet, why not? A hundred years ago, most of the discoveries and improvements that have taken place in that time seemed as impossible to our forefathers as anything that we could possibly imagine that might take place within the next hundred years. Take the Hardware trade alone, the changes and improvements within the recollection of the writer are wonderful; and as to the business itself, it has grown beyond the most sanguine expectations of most of us.

The outlook for the new year is excellent. There are talks of still higher prices on some lines of goods, and some have recently advanced, notably Wire and Nails; but it is our opinion the "top notch" is about reached. How long these "top notch" prices can be maintained

is a problem that we wish we were able to solve. Could we do so, we would not be selling Gimlets and Screws for a living. Orders for futures on many lines were never so large, and there threatens to be a shortage on some. The immense orders for Fence Wire, however, that were on the books at this time last year, are lacking. Retailers have carried over much and there is little or no demand. How much of this commodity the farmers will be forced to buy when spring opens is hard to say, but the recent advance (December 29) of $5 per ton is not going to make them tumble over each other to get their orders in. The American Steel & Wire Company can "drive their horse to water, but they cannot make him drink."

Wishing you and our friends throughout the trade the compliments of the season.

Nashville.

THE GRAY & DUDLEY HARDWARE COMPANY.—We are now experiencing the lull in business which can reasonably be expected just after the holidays. The traveling men are at home with their families, enjoying their vacation. While the people about the offices are doing but little trading, they are actively preparing for the spring trade, which usually commences in this section early in January.

The manufacturers' prices are being pretty generally maintained by the jobbers. We hear of some irregularities in the price of Nails, caused by some small dealers who had rather large stocks which they wanted to reduce.

The December business has been a great deal heavier than usual this year, attributable in part to the fact that our country is in a prosperous condition, but largely owing to the fact that the Cumberland and Ohio rivers were opened for navigation early in this month, after having been closed for some months.

In this our last report of the year, we do not believe that any one will take issue with us in the statement that 1899 has been a remarkably good year for the manufacturers and dealers in Hardware and Metals, and at this writing the prospects for business in 1900 are certainly flattering.

The attention of Eastern and Northern capitalists has been attracted by our section of country, and they are now rapidly developing our mining interests, which are principally Coal, Iron, Copper and Phosphate. The latest mining enterprise that we have heard of is the purchase by the United States Iron Company of large bodies of mining lands in Lawrence and Wayne counties, Tenn., and North Alabama, where some mines have already been opened and railroads are being built. As this company have ample capital and are officered by Jno. W. Gates, as president, and his son, Charles Gates, as secretary, they will no doubt be a prominent figure in the mining interests of this country in future. In no other section of the country has there been any greater manifestation of industrial developments than in the South.

Hope that we may be able to send you as encouraging reports in 1900 as we have had the pleasure of doing in 1899. We wish *The Iron Age* and its many readers a Happy New Year.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—It was the intention of our firm in the opening of the year to take somewhat of a retrospective view of the conditions of the country, including the Hardware trade, for the past year. Many matters, however, incidental to the first of the year have prevented the writer, who has charge of the correspondence with *The Iron Age*, entering into this feature in time for this week's issue, therefore it will be deferred until a later date.

Houses generally are in the midst of stock taking, some of those who were fortunate enough to begin earlier in the month have entirely completed their inventory, but the trade of our house having continued in more than usual volume up to January 1 this inventory will not be completed until some time during the present week.

Trade during the month continued unusually large in comparison with any previous year and scarcely diminished in volume up to the last day of the month. Good fair mail orders this, the second day of January, are an encouraging sign for the year. Collections continued fair during the month of December.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The close of the present year calls attention to the fact that 1899 has been the most prosperous in the history of the region west of the Missouri River.

A steady, continuous improvement in business conditions has developed since the year opened. The producing community has been favored with bountiful crops. Live stock of all kinds have increased to a large extent, and the market prices have been sustained on a very profitable basis. Thus, the people at large have been supplied with money, both for the necessities and luxuries of life. It is no wonder, therefore, that everybody feels satisfied and confident that the coming year will continue to exhibit an equally favorable condition of affairs.

Notes on Prices.

Wire Nails.—An advance of 25 cents per keg was made in the price of Wire Nails by the American Steel & Wire Company on December 30, to take effect at once. In connection with the present advance in price it is to be noted that the terms are now 30 days, or 1 per cent. off for cash in ten days, instead of 30 days net as heretofore. After January 1 the commercial part of the company's business in the Eastern district will be concentrated in their office in the Empire Building in New York City. Manufacturers' quotations are now as follows, f.o.b. Pittsburgh; terms, 30 days, 1 per cent. off in ten days:

To jobbers in carload lots	$3.20
To " in less than carload lots	3.22½
To retailers in carload lots	3.35
To " in less than carload lots	3.45

New York.—The manufacturers' advance in Wire Nails is reflected in the local market. Owing to stocks in jobbers' hands, purchased before the advance, quotations for small lots from store are irregular. Stocks in jobbers' hands, as a rule, are not large, while retail stocks in this territory are limited. Retailers have been buying only for immediate requirements, and for the past month orders have been accompanied by requests for prompt shipments. Quotations are as follows:

To retailers, carloads on dock	$3.53
To " less than carloads on dock	3.66 to 3.66
Small lots from store	$3.50 to 3.75

Chicago, by Telegraph.—The American Steel & Wire Company made an advance of 25 cents per keg, effective December 30. The trade had been expecting some advance and jobbers therefore placed large orders last week, thus giving manufacturers a lively business. The advance was larger than had been anticipated, so that those who had placed orders are to be congratulated. The single carload price is now on a basis of $3.53, Chicago, while small lots from stock have been marked up to correspond and are now $3.63.

St. Louis, by Telegraph.—As elsewhere noted an advance of 25 cents per keg has been made on Wire Nails. It seems to have caught the trade unawares and at a time when stocks are comparatively short. The market is quiet at present. Prices for single carloads are now $3.58, base, St. Louis, and for small lots $3.68.

Pittsburgh.—As intimated in this report last week the price of Wire Nails has again been advanced 25 cents a keg, the advance going into effect December 30. We are advised that the demand for Wire Nails up to the holidays kept up remarkably well, and indications are that buyers will place orders quite freely from this time forward. This last advance in prices should thoroughly convince the trade that there will be no reduction in price, as some had anticipated. The tone of the market is strong and

we quote, f.o.b. Pittsburgh: To jobbers in carload lots, $3.20; to jobbers in less than carload lots, $3.22½; to retailers in carload lots, $3.35; to retailers in less than carload lots, $3.45.

Cut Nails.—As a result of a conference between Eastern and Western Cut Nail manufacturers, held last week, manufacturers' quotations are as follows, f.o.b. Pittsburgh; terms, 30 days, 1 per cent. off in ten days:

To jobbers in carload lots	$2.50
To " in less than carload lots	2.55
To retailers " " " "	2.65

While $2.50 has been obtainable by jobbers in carload lots for some time this price has not before been officially recognized.

New York.—The action of the manufacturers in officially announcing the mill price of Cut Steel Nails which has been ruling may have a stiffening effect upon the local market, but much change in prices is not expected. Demand for December was for small lots, but as orders were frequent the distribution in the aggregate was quite large. Present quotations are as follows:

To jobbers in carloads on dock	$2.68
To " in less than carloads on dock	$2.73 to 2.77
To retailers, " " " "	2.85 to 2.86
Small lots from store	2.80 to 2.85

Chicago, by Telegraph.—Notwithstanding the advance in Wire Nails no change has been made in Cut Nails, small lots from stock being still quoted by jobbers at $2.80.

St. Louis, by Telegraph.—Some stiffening in prices and perhaps advance may be looked for in view of the $5 per ton raise on Wire Nails. To-day prices remain at $2.80, base, at jobbers', and demand about normal.

Pittsburgh.—The Eastern and Western Cut Nail manufacturers have fixed the price of Cut Nails at $2.50 in carload lots and $2.65 in less than carload lots, f.o.b. Pittsburgh, freight to destination added; terms 30 days net, or 1 per cent off for cash in ten days from date of shipment. The demand for Cut Nails at the present time is quiet, but indications favor a larger business this month. There will not be any advance in price of Cut Nails for the present at least.

Barb Wire.—The advance and terms in the price of Wire Nails, as noted above, also apply to Barb Wire. Domestic demand continues light, but an improvement in this direction is expected when spring orders are placed. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash, or 1 per cent. off in ten days:

To jobbers in carload lots, Painted	$3.65
To " " Galvanized	3.80
To " in less than carload lots, Painted	3.67½
To " " " " Galvanized	3.82½
To retailers in carload lots, Painted	3.80
To " " Galvanized	3.95
To " in less than carload lots, Painted	3.90
To " " " " Galvanized	4.05

Chicago, by Telegraph.—Manufacturers report a large business last week in all kinds of Wire, jobbers buying heavily in the general expectation of an advance at the end of the month. The American Steel & Wire Company have advanced prices 25 cents per 100 pounds, effective December 30, and quotations are now as follows, Chicago delivery: Single cars of Plain Annealed Wire, $3.38; Painted Barb Wire, $3.98; Galvanized Barb Wire, $4.13, with 10 cents additional for small lots from jobbers.

St. Louis, by Telegraph.—No new features have presented themselves as to demand, but the advance of 25 cents per 100 pounds has caused some regret to dealers who had not laid by a supply. Painted in single cars is now $4.03 and $4.13 is asked for small lots. Galvanized is unchanged at the advance of 15 cents on above prices.

Pittsburgh.—Taking effect Saturday, December 30, prices on Plain and Galvanized Wire were advanced 25 cents per 100 pounds. Domestic demand continues light, but a good deal of Wire is being sent abroad. It is claimed that stocks of Wire are light, and while present demand is small an improvement is looked for before long, as buyers will soon be placing orders for spring trade. We quote Painted Barb Wire at $3.65 in carload lots to jobbers, with an advance of 15 cents for Galvanized, all f.o.b. Pittsburgh.

Smooth Wire.—Smooth Wire has also been advanced 25 cents. Demand continues moderate, but with the prospect of increasing. Quotations are as follows, f.o.b. Pittsburgh; terms 30 days, or 1 per cent. off in ten days:

To jobbers in carload lots	$3.05
To " in less than carload lots	3.07½
To retailers in carload lots	3.20
To " in less than carload lots	3.30

Pittsburgh.—Demand just now is light, but is expected to materially improve, as jobbers and retailers will soon be placing orders for spring trade. As intimated in this report last week would be the case, prices of Smooth Wire have been advanced 25 cents per 100 pounds. We quote: To jobbers in carload lots, $3.05; to jobbers in less than carload lots, $3.07½; to retailers in carload lots, $3.20; to retailers in less than carload lots, $3.30, all f.o.b. Pittsburgh. The charge for galvanizing is 50 cents on sizes from Nos. 6 to 14 inclusive; on Nos. 15 and 16, 85 cents, and on Nos. 17 and 18, $1.10.

Stanley Rule & Level Company.—Under date January 1, 1900, Stanley Rule & Level Company, New Britain, Conn., and 107 Chambers street, New York, issue a revised discount sheet, as follows:

	Discount. Per cent.
Rules, Boxwood, Stanley's	75 and 10
" Zig Zag, Stanley's	25 and 10
" Ivory, Stanley's	35 and 10
" Miscellaneous, Stanley's	55 and 10
" Extension	25 and 10
" Ivory, Stearn's	35 and 10
Plumbs and Levels	70 and 10
" " " Duplex	25 and 10
" " " Ground Glasses	25 and 10
Level Glasses, Ground	25 and 10
Pocket Levels, Hexagon, Nos. 31 and 33	20 and 10
Levels, Eclipse, No. 34	20 and 10
Plumbs and Levels, Metallic, Nos. 36 and 37	20 and 10
Levels, Machinists', Nos. 38½ and 39½	20 and 10
Level, Bit and Square, No. 44	20 and 10
" Sights, No. 1	20 and 10
Pocket Levels, Nos. 40, 41, 42 and 46	70 and 10
Level Glasses, Proved	60 and 10
Try Squares, Iron Handle, No. 12	30 and 10
Bevels, Patent Eureka, No. 18	30 and 10
Try Squares, No. 20	60 and 10
Bevels, Sliding T, No. 25	60 and 10
Miter Try Squares, No. 15	30 and 10
" Squares, No. 16	30 and 10
Try and Miter Squares, Winterbottom's	40 and 10
" Squares, Inlaid, No. 10	30 and 10
" " Adjustable, No. 14	30 and 10
Gauges	55 and 10
" with Improved Face Plate	55 and 10
" Butt and Rabbet, No. 92	20 and 10
" Metallic, No. 91	20 and 10
Butt Gauge, No. 95	20 and 10
Planes, Bailey's Adjustable, Iron	50 and 10
" " " Wood	50 and 10
Plane Irons, Bailey's and Stanley's	50 and 10
Planes, Bailey's Adjustable, Iron	50 and 10
" " " Corrugated	50 and 10
Trammel Points, No. 4	30 and 10
Gauges, Metallic, Nos. 90 and 91	20 and 10
Planes, Stanley Adjustable, Block	50 and 10
" Bailey's " "	50 and 10
" Circular, Nos. 13, 20 and 113	50 and 10
" Scraper, Nos. 112	50 and 10
" Stanley Adjustable, Steel	50 and 10
" " " Wood	50 and 10
" " " Block	50 and 10
Scrapers, Cabinet, No 80	20 and 10
" Stanley's Hand, No. 0	20 and 10
Planes, Bull Nose Rabbet, No 90	25 and 10
" Side Rabbet, Nos. 98 and 99	25 and 10
" Rabbet and Block, No. 140	25 and 10
" Chamfer, Nos. 72 and 72½	25 and 10
" Beading, Rabbet, &c., No. 45	25 and 10
Hollows and Rounds for Plane No. 45	25 and 10
Planes, Nosing, for Plane No 45	25 and 10
Plow, Dado, &c., Nos. 46 and 47	25 and 10
" and Matching Plane, Bull Nose	25 and 10
Planes, Scrub, No. 40	25 and 10
" Tongue and Groove, Nos. 48 and 49	25 and 10
" Beading, No. 50	25 and 10
" Rabbet, Nos. 180 to 192	25 and 10
" " and Filletster, No. 78	25 and 10
" Core Box, No. 57	25 and 10
" Router, Nos. 71 and 71½	25 and 10
" Floor, No. 74	25 and 10
" Universal, No. 55	25 and 10
Beaders, Hand, Nos. 66 and 69	20 and 10
Spoke Shaves, Universal, No. 67	20 and 10
"	50 and 10
" Shave Cutters	50 and 10
Box Scraper, Adjustable, No. 70	30 and 10
Scraper, with Handles and Roller, No. 83	20 and 10
Trammel Points, Nos. 1, 2 and 3	30 and 10
Plumb Bobs, Adjustable, Nos. 1, 2 and 5	30 and 10
Countersinks, Wheeler's, Nos. 18 and 20	40 and 10
Dowel Sharpener, No. 22	40 and 10
Trammel Points for Rules, No. 99	20 and 10

Chisel Gauge, No. 96	20 and 10
Miter Boxes, Nos. 50 and 60	20 and 10
Clapboard Marker, No. 88	20 and 10
" Gauge, No. 89	20 and 10
Odd Jobs, No. 1	20 and 10
Roofing Brackets, No. 1	20 and 10
Tool Handles and Tools, Excelsior	30 and 10
Awl Hafts	50 and 10
Awls, Patent Pegging	50 and 10
Chalk Lines, Reels and Awls	30 and 10
Scratch Awls, Handled	30 and 10
Brad Awls, Handled	30 and 10
Handles, Brad Awl	30 and 10
" Plane	40 and 10
" Saw	40 and 10
Mallets, Hickory and Lignum Vitæ	25 and 10
Hammers, Magnetic, Nos 1, 2, 3 and 12	40 and 10
" Tack, Nos. 4 and 5	40 and 10
" Steak, Nos. 7, 8, 9 and 10	40 and 10
Screw Drivers, No. 64, Varnished Handles	60 and 10
" " No. 86	70 and 10
" Driver Handles	55 and 10

In a circular letter accompanying it they refer to the large business of the past year and their increased facilities, which they trust will enable them to execute orders promptly. They also call special attention to their Zig Zag Rules.

Screws.—Under date January 1, 1900, the associated Screw manufacturers adopted a revised list for Iron Wood Screws, the list on Brass remaining as before. No change is made in discounts, which continue at the base price of 80 per cent., as heretofore. It will be observed that the new list, which is given herewith, has been subjected to a general revision and is slightly higher than the one it supersedes.

REVISED LIST FOR IRON WOOD SCREWS.—ADOPTED JANUARY 1, 1900.

No. / Inches.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24	26	28	30
¼	63	63	63	63	63																				
⅜	63	63	63	63	63	63	64	71	80	84															
½		63	63	63	63	64	66	76	80	84	87	92	100												
⅝		63	63	63	63	67	72	78	85	88	91	95	100	105	115										
¾			63	64	65	70	77	82	88	92	97	105	110	115	125	140	165								
⅞			65	67	70	75	82	87	92	95	105	110	115	125	135	160	185								
1				73	76	80	87	93	98	105	115	120	125	140	160	185	210	230	265	315					
1¼				80	83	91	98	105	110	115	120	130	140	155	175	200	230	255	280	335	400	475			
1½				90	95	100	105	110	120	125	130	140	155	170	190	220	245	275	315	350	420	495			
1¾						120	125	133	140	145	150	160	170	185	205	235	265	300	340	400	470	525			
2						130	135	140	150	155	160	170	180	205	235	265	295	330	385	440	480	550			
2¼						145	150	155	160	165	175	185	200	220	245	285	325	355	410	485	525	575			
2½						175	180	185	190	200	210	215	225	240	260	305	340	375	435	520	585	650			
2¾							220	225	230	235	240	245	255	265	285	325	365	405	475	570	660	740			
3							260	265	270	275	280	285	290	300	315	340	385	440	510	615	685	770	940		
3½									350	360	370	380	395	405	415	435	460	495	575	680	760	875	1060		
4									440	450	460	470	480	490	500	520	535	605	675	785	875	1005	1210	1410	1625
4½													610	620	635	665	690	725	785	870	1015	1165	1380	1595	1810
5													710	730	760	800	840	880	940	1010	1170	1325	1575	1780	2000
6													870	900	930	990	1060	1125	1265	1380	1500	1620	2000	2255	2515

Pumps.—A meeting of the Pump manufacturers has recently been held, at which existing prices were confirmed. The association discount of Pitcher Spout Pumps remains 70 and 10 per cent., which fairly represents the market, though a slightly lower price is often made by manufacturers or jobbers to retail buyers.

Perkins' Toe Calks.—The Rhode Island Perkins Horseshoe Company, Providence, R. I., have withdrawn former quotations on Perkins' Toe Calks and quote 4½ cents per pound for Blunt and 5½ cents per pound for Sharp, f.o.b. mill, Valley Falls, R. I., less 1 per cent. discount for cash in ten days.

Henry Disston & Sons.—An error occurred in the reference in our last issue to the new discount sheet of Henry Disston & Sons, Philadelphia, inasmuch as it was stated that the discounts given were net and not subject to further allowance or concession. We desire to correct this, as the discounts printed are subject to the regular discount heretofore given.

Peck, Stow & Wilcox Company.—Peck, Stow & Wilcox Company, Southington, Conn., and 27 Murray street, New York, under date of January 1, 1900, issue discount sheet No. 5 from the list prices printed in their catalogue of 1898. While the schedule covers the entire book the changes, with very few exceptions, apply only to the first 131 pages, containing Tinners' Tools and Machines, on which comparatively moderate advances are made.

Lead Pipe, Sheet Lead, &c.—Under date January 2 an advance is announced by the manufacturers of Lead Pipe, Sheet Lead, &c., the prices on which are now as follows, subject to the regular discount of 20 per cent.:

	Cents per pound.
Lead Pipe	7
Sheet Lead	8
Tin Lined Lead Pipe	12½

Indurated Fiber Ware.—Cordley & Hayes, 172 Duane street, New York, announce an advance in prices, taking effect January 1, on their Star Pails of 20 cents per dozen list, and on their Washtubs of 60 cents per dozen list. This advance is referred to as less than 10 per cent. and does not cover, it is stated, the actual increase in cost of materials.

Chucks.—Owing to the increased cost of materials and labor the Skinner Chuck Company, New Britain, Conn., have found it necessary to advance the price of their Chucks, the advance taking effect January 1. They refer to the demand as excellent.

Cordage.—Prices of Rope continue on the basis of 15½ cents, 7-16 inch and larger, for Manila, and 10½ cents for Sisal of corresponding sizes, in less than carload lots. The market is firm and an advance in prices is not improbable. Jute Rope is firm at 7 cents for No. 1, ¼-inch and up, and 6¼ cents for No. 2, ¼-inch and up. Manufacturers' quotations for Rope in less than carload lots are as follows, with a reduction of ¼ cent per pound for carloads:

	Per pound. Cents.
Manila, 7-16 inch and larger	15½
" ⅜ inch	16
" ¼ and 5-16 inch	16½
Sisal, 7-16 inch and larger	10½
" ⅜ inch	11
" ¼ and 5-16 inch	11½
" Lath Yarn, Medium and Coarse	10

Manila Tarred Rope, 15 thread, is quoted at 15½ cents, as is also Manila Hay Rope, Medium.

The Manila Hemp producing territory is in the southern part of the island of Luzon, so that the opening of ports in the northern part of the island is not expected to relieve the scarcity of Manila Hemp.

Binder Twine.—Eastern manufacturers are making the following prices on Binder Twine in carload lots, f.o.b. New York, Philadelphia or Boston, with an advance of ¼ cent per pound for less than 10,000 pounds and an advance of ⅛ cent per pound for over 10,000 pounds and less than a carload:

	Cents.
White Sisal, 500 feet to pound	11¼
Standard, 500 feet to pound	11¼
Manila, 600 feet to pound	14¼
Pure Manila, 650 feet to pound	15¾

Manufacturers state that while prices of Binder Twine may be higher they are willing to make deliveries at the foregoing quotations at any time, as they would cover their requirements in raw materials for the orders placed. But few orders for Twine have been placed thus far.

Drive Screws.—Russell & Erwin Mfg. Company, New York, announce a revised list, given in another column, on their Diamond Point Steel Screws, the list being subject to the following discounts:

	Per cent.
Oval and Flat Head	80
Round Head	75

Tire and Stove Bolts.—Under date December 28, 1899, the associated manufacturers of Stove and Tire Bolts have adopted revised list prices on both of these lines. The Stove Bolt list, which is printed herewith, is subject to a discount of 60 per cent., and the Tire Bolt list to a discount of 57 per cent.

Revised List, for Stove Bolts.

Adopted December 28, 1899.

Flat Head. Price per 100.					Round Head. Price per 100.				
Length.	1/8 & 5/32 & 3/16	7/32 & 1/4	5/16	3/8	Length.	1/8 & 5/32 & 3/16	7/32 & 1/4	5/16	3/8
3/8	$0.75				3/8	$0.85			
1/2	.75	0.90			1/2	.85	$1.00		
5/8	.75	.90			5/8	.85	1.00		
3/4	.75	.90	$1.30	$2 50	3/4	.85	1.00	$1.55	$2.65
7/8	.80	.95	1.35	2.55	7/8	.90	1 05	1.60	2 70
1	.80	.95	1.40	2.60	1	.90	1.05	1.65	2.75
1 1/8	.85	1.00	1.45	2 65	1 1/8	.95	1.10	1.70	2 80
1 1/4	.85	1.00	1.50	2.70	1 1/4	.95	1 10	1.75	2.85
1 3/8	.90	1.05	1.60	2.80	1 3/8	1.00	1 15	1.80	2.90
1 1/2	.90	1.05	1 70	2 90	1 1/2	1.00	1.15	1 85	2 95
1 3/4	.95	1 10	1.80	3.00	1 3/4	1.05	1.20	1.95	3.05
2	1.00	1.15	1.90	3.10	2	1.10	1.25	2 05	3 20
2 1/4	1.05	1.20	2 00	3.20	2 1/4	1.15	1.30	2 15	3.35
2 1/2	1.10	1 25	2.10	3.30	2 1/2	1.20	1.35	2.25	3 50
2 3/4	1.15	1.30	2.20	3.40	2 3/4	1 25	1.40	2 35	3.65
3	1.20	1.35	2 30	3 50	3	1 30	1.45	2.45	3.80
3 1/4	1.25	1.40	2.40	3 60	3 1/4	1.35	1.50	2.55	3.95
3 1/2	1.30	1.45	2.50	3 70	3 1/2	1.40	1.55	2 65	4.10
3 3/4	1.35	1.50	2.60	3.80	3 3/4	1.45	1.60	2.75	4.25
4	1.40	1.55	2.70	3.90	4	1.50	1.65	2 85	4 40
4 1/4	1.45	1.60	2 80	4.05	4 1/4	1.55	1.70	2.95	4.55
4 1/2	1.50	1.65	2.90	4.20	4 1/2	1.60	1 75	3.05	4.70
4 3/4	1.55	1.70	3.00	4.35	4 3/4	1.65	1.80	3.15	4.85
5	1.60	1.75	3.10	4.50	5	1.70	1 85	3.25	5.00
5 1/4	1.65	1.80	3.20	4.65	5 1/4	1.75	1.90	3.35	5.15
5 1/2	1.70	1.85	3.30	4.80	5 1/2	1.80	1.95	3.45	5.30
5 3/4	1.75	1.90	3.40	4 95	5 3/4	1.85	2.00	3.55	5.45
6	1.80	1.95	3.50	5.10	6	1.90	2.05	3.65	5.60

Nickel Plated Stove Bolts, add $1 to above list prices.

Revised List for Tire Bolts.

Adopted December 23, 1899.

Length.	1/8 & 3/16	1/4	5/16	3/8
1	$0.60	$0.95		
1 1/4	.60	.95	$1.40	$2.20
1 1/2	.60	.95	1.40	2.20
1 3/4	.65	1.00	1.40	2.20
2	.70	1.05	1.47	2.20
2 1/4	.75	1.10	1.54	2.30
2 1/2	.80	1.15	1.61	2.40
2 3/4	.85	1.20	1.68	2.50
3	.90	1.25	1 75	2.60
3 1/4	.95	1.30	1.82	2.70
3 1/2	1.00	1.35	1.89	2.80
3 3/4	....	1.40	1.96	....
4	....	1 45	2.03	3.00
4 1/4	....	1.50	2 10	3.10
4 1/2	....	1 55	2.17	3.20
4 3/4	....	1.60	....	3.30
5	...	1.65	2.31	3.40
5 1/2	...	1.75	2.45	3.60
6	....	...	2 59	3 80

Glass.—There has been no announcement of a change in price by the American Window Glass Company. All of the Glass factories which are to be started at present were expected to be put in operation on January 2, and will continue making Glass until the middle of June, according to present calculations. Some of the combined factories are not expected to be operated at all this fire. There is an estimated shortage of blowers required to run the pots which are expected to be put in operation now, in addition to factories which may be ready to start up early in the spring. A paper devoted to the Glass interest, after calculating the probable production, imports and consumption, arrives at the conclusion that not over 1,500,000 boxes of Glass will remain in manufacturers' hands on June 15 and that the assortment will be badly broken in the fall, if conditions prevail similar to those of the year just closed. Carloads from factory are quoted at 90 per cent. discount for single and 90 and 10 per cent. discount for Double Strength Glass for satisfactory specifications. It is understood that these prices do not apply to the first five brackets double, nor the first bracket single, for which a higher price is charged. It is reported that the combine is making a bid for the carload trade by paying a 2½ per cent. commission to jobbing firms who send in carload orders from small dealers, the Glass to be shipped direct from the company's factories to the carload buyer.

Paints and Colors.—*Leads, &c.*—Under date of January 2 the National Lead Company announced an advance of ¼ cent in the price of White Lead, Dry or in Oil, Red Lead and Litharge in kegs, as follows: In lots of less than 500 pounds, 7 cents; in lots of 500 pounds and over, 6½ cents per pound. Dry White Lead in barrels, ½ cent per pound less than the price in kegs. Red Lead and Litharge in barrels and half barrels the same price as in kegs. The extras for tin packages and the terms remain as before. Prospects for a large business in these goods are bright for the present year.

Oil.—*Linseed Oil.*—Prices continue at 51 cents per gallon for City Raw Linseed Oil in lots of less than five barrels, and 50 cents in lots of five barrels and over. Outside brands are quoted at 1 to 2 cents less. Demand is merely fair and buyers will continue a hand to mouth policy of purchase until there is a decline in prices. Some of the tank Oil which was contracted for in June at 32 to 34 cents per gallon is being resold, but holders as a rule are waiting for higher prices before putting this Oil on the market.

Spirits Turpentine.—There is very little doing at this point in Turpentine. Stocks are large, but prices are too high to offer inducements to buyers unless their needs are pressing. It is estimated that stocks carried over into the new year by jobbers and large consumers are light, and that they will be obliged to come into the market in the near future to cover actual requirements. There has been a gradual advance in prices during the week under review. A stronger Southern market has developed under export buying and inquiries for contract prices for future delivery. The local market is firm at 52½ cents for Southerns and 53 cents for machine made barrels.

Putty.—The American Whiting & Putty Mfg. Company have advanced prices on Putty, owing to higher values of Linseed Oil and Whiting. Wood and tin packages have also advanced in price. It will be noticed in the following quotations that a new classification has been adopted for Putty in tin cans:

In bulk	$1.85
" bladders	2.25
" cans, 50 pounds	2.00
" " 25 "	2.25
" " 12½ "	2.50
" " 5 "	3.50
" " 3 "	4.00
" " 2 "	4.50
" " 1 pound	5.00

Request for Catalogues, &c.

G. H. BURNETT has bought out the Hardware business formerly carried on by J. J. Seely, 45 Germain Street, St. John, N. B., and will continue at the old stand. Mr. Burnett would be pleased to receive catalogues, price-lists, &c., from manufacturers of general Hardware and novelties and specialties.

Hardware Organizations.

Minnesota Retail Hardware Association.

The fourth annual convention of the Minnesota Retail Hardware Association will be held in Duluth on February 14, 15 and 16, at which time a meeting will also be held of the Northwestern Retail Hardware Association, comprising the States of Minnesota, Wisconsin and North Dakota. Touching on this matter as well as the necessity for organized effort on the part of the trade, the following circular has been issued by James E. O'Brien, president of the association, addressed to the retail Hardware dealers of the State of Minnesota:

We are asked again to lay aside the regular routine of business cares for a few days, and occupy the higher attitude of directing our thoughts toward the betterment and uplifting of the principles that underlie our commercial life.

This cannot be brought about through a spirit of selfishness; it can only be accomplished by viewing the conditions that surround us with the aim in view of accomplishing the greatest good to the greatest number; for while the influence we are organized to combat may not in a noticeable degree affect our individual affairs to-day, it is admitted on every hand to be a rapidly growing evil, that will, if not checked by united and untiring effort, encompass and wipe out every business concern in existence that is directed in the channel that we now occupy.

This concentration of capital in large corporations for the purpose of controlling the distribution of all kinds of merchandise, oftentimes, as it is guided by a single individual, is withering in its effect, as a labor destroyer, a tax evader, a wealth concentrator, resulting ultimately in the complete enslavement of the many by the few.

And here let me add that to contend against an evil so far reaching in its effect requires action on our part with a magnanimity that will border on patriotism.

With these grand sentiments that it has been my pleasure in the past to witness displayed by the members of our State organization of retail Hardwaremen (by the way, the greatest organization of its kind on this continent), may I not, health permitting, expect when the gavel falls at the call to order of the convention of these men at Duluth on February 14 next to witness one of the largest gatherings that has up to the present assembled for a similar purpose ?

Your servants desire to render a report of what has transpired during the past year, and present you with the gift of a substantial foundation on which our organization can securely rest for years to come.

In conclusion I wish to say that the city of Duluth is making extensive arrangements to receive and take care of her guests on that occasion; let us show our appreciation of this recognition and kindness in store for us by our presence. Let every dealer in the State, whether at present a member of our association or not, feel that he is welcome, and that his aid is desired in demonstrating to the citizens at the future avenue to the commerce of the Northwest at the head of the lakes that all the good things that have been written of our organization in the trade papers of the country were but facts placed in print.

On behalf of the Minnesota Retail Hardware Dealers' Association it affords me much pleasure in extending an invitation to the officers and members of similar State organizations to be present and lend us their assistance in bringing the issues before us to a successful conclusion.

Again hoping that I may meet you, one and all, and renew and extend the pleasant acquaintance it was my privilege to enter upon but four short years ago, I have the honor to remain, &c.

Elaborate preparations are being made for this meeting, which is likely to prove the most important and successful in the history of this large and substantial association. A souvenir programme has been prepared, which will be sent to the 2500 Hardware merchants in the States of Minnesota, Wisconsin and North Dakota. This programme is in reality a valuable book, as it contains many items of interest to the Hardware trade. Among matters touched on are the Hardware trade of the Northwest, papers read in former conventions, a history of the association, with its aims and purposes, an article on the mutual fire insurance feature, a general review of the past year's business by a number of prominent merchants, &c. Space will be arranged in the convention hall for any exhibits which manufacturers may desire to make.

Thomas McCracken, 323 Boston Block, Minneapolis, is secretary of the association, and will be pleased to respond to inquiries relative to the coming meeting.

Southern Hardware Jobbers' Association.

On account of the recent loss by fire sustained by the Fones Bros. Hardware Company, Little Rock, Ark., of which company Jas. J. Mandlebaum is secretary, Mr. Mandlebaum has felt that so much extra work has been thrown upon him as a result of the fire that he could not in justice to the Southern Hardware Jobbers' Association serve out the remainder of his second term as president, as it would be impossible for him to give it the time necessary to carry on the work of the association, and he has accordingly tendered his resignation, which has been accepted by the Executive Committee with regret, as they recognize that Mr. Mandlebaum has made one of the most active and progressive presidents during the existence of the association.

O. B. Barker of Barker-Jennings Hardware Company, Lynchburg, Va., the first vice-president, succeeds to the office of president for the unexpired term. He has appointed C. B. Carter secretary-treasurer, with association headquarters in Knoxville, being under the supervision of Mr. Carter. It will be remembered that Mr. Carter held this same position from January 1, 1896, to July 1, 1899, except that formerly his headquarters were always in the same city with the president of the association.

All association business will be transacted through the Knoxville office, and all communications pertaining thereto should be addressed to Mr. Carter, and such matters as shall need the attention of the president and Executive Committee will be promptly referred to them for consideration. In this way it will lessen the work thrown upon the president of the association, who serves without any compensation, and throws more work and responsibility upon the secretary-treasurer, who is a salaried officer.

Missouri Retail Stove and Hardware Dealers' Association.

For the purpose of securing a very low railroad fare the annual meeting of the Missouri Retail Stove and Hardware Dealers' Association has been postponed until February 20, as per the following circular, which has been issued by J. W. Poland, president, Carrollton, and E. Thomas, secretary, Trenton:

To enable the members of the Missouri Retail Stove and Hardware Dealers' Association to receive the benefit of reduced railroad rates, it is deemed advisable by the Executive Committee to postpone the meeting of the convention to be held in St. Louis, Mo., February 6, 1900, to February 20, 1900.

By this action a fare of one and one-fifth for the round trip can be secured.

The matter of transportation is of considerable importance, especially to those living in remote parts of the State, and we trust that our action will meet with the approval of the members of the association.

Kansas Retail Hardware Dealers' Association.

The Kansas Retail Hardware Dealers' Association will hold their annual meeting at Topeka on January 9 and 10. An interesting programme has been prepared for the different sessions, and the proceedings will doubtless be entertaining and profitable. Reduced rates on all the railroads in the State have been secured, so that a large representation of merchants in that section is confidently expected. The secretary of the association is J. A. Cole, who may be addressed at Topeka.

Chicago Retail Hardware Dealers' Association.

The Chicago Retail Hardware Dealers' Association will give their seventh annual reception and ball on Wednesday evening, January 17. The scene of the gathering will be Schoenhofen's Hall, corner Milwaukee and Ashland avenues.

Trade Banquets.

Farwell, Ozmun, Kirk & Co.'s Dinner.

THE annual dinner tendered by Farrell, Ozmun, Kirk & Co, St. Paul, to their employees was held at the Hotel Ryan in that city on the 21st ult. Nearly 200 covers were laid, and the members of the firm and their traveling force were fully represented. After the coffee an address of welcome was delivered by the president of the corporation, R. A. Kirk, following which there were informal talks by the guests on topics of their own selection. The guests were privileged, however, as the neat programme of the evening's exercises puts it, to sing a song or tell a story, "but not even loss of voice or cold feet will be considered a valid excuse for a failure to respond to the request of the president" for a few words. An attractive musical programme was rendered by Miss Hope's ladies' orchestra. There were also some humorous and sentimental vocal selections, conspicuous among which were those by the "Barb Wire (Four Point) Quartette." The occasion was a most successful one, and all were much impressed with the very cordial and fraternal spirit manifested between employers and employees.

Gray & Dudley Hardware Company's Banquet.

THE annual banquet of the Gray & Dudley Hardware Company, Nashville, Tenn., was held on the 23d ult. The employees of the company met at the office on Market street and marched to the Tulane Hotel, headed by the Gray & Dudley Hardware Company's Band, consisting of 24 pieces, which played several popular airs *en route*. It has been the custom for a long time for the senior director, J. M. Gray, to invite all of the officers and employees of the company to a banquet at the close of the year. It was 9 o'clock when the brilliantly illuminated and well appointed dining room was thrown open. The tables were admirably arranged and beautifully decorated with palms, chrysanthemums, azaleas, &c. One hundred and two persons participated in the banquet. An elaborate menu was served, after which the president, R. M. Dudley, who had been chosen to act as toastmaster, in a few introductory remarks congratulated the officers and employees of the company on rounding up the most prosperous year in their history, taking occasion to thank the employees for the very hearty support which they had given the officers of the company during the past year, stating that the success of the company was due entirely to those assembled, and referred to the policy of the company in promoting men in their employ rather than choosing men from the outside when positions were made vacant in the company. In this connection he read a list of names of 18 young men who had been promoted during the last 12 months, and stated that the policy of the company in this respect would be the same in future as it had been in the past.

The first speaker introduced was J. M. Gray, Jr., the popular vice-president of the company, who, in the name of his father (who was absent on account of sickness), bid all a hearty welcome. In the course of his remarks he stated that his father requested him to say that it afforded him great pleasure to entertain the employees of the company in this most delightful social manner, as it promoted kindly feeling and good fellowship. Mr. Gray referred to the deaths during the year of two of their associates. Last year, he said, 65 people sat down to the banquet; this year over 100. Last year their traveling salesmen numbered 16, now they have 24 travelers. Last year they were using almost a bundle of scrap paper for a catalogue, now they have a handsome Hardware catalogue of 1300 pages, which cost $12,000. Last year they were paying rent for a dark, badly arranged building, but they will soon occupy a new seven-story building—the largest and handsomest business house in the State. These, Mr. Gray said, were some of their achievements for 1899. Mr. Gray closed with a reference to the possibilities of the future in view of what had been accomplished during one year.

R. H. Dudley, Jr., secretary of the company, was then introduced and spoke to the toast, "The Possibilities of the Gray & Dudley Hardware Company." In part he said:

"My imaginative eye is not strong enough to picture the possibilities of the Gray & Dudley Hardware Company, but if you will look a short distance into the future I will show you a handsome seven-story structure; this is to be our home. The first floor of this building, on which the office will be located, will also contain the most handsomely equipped retail Hardware store in the United States, and that the gentlemen sitting opposite me are to have charge of this department is a sufficient guarantee that it will be equally as well managed as any store in the country. When I consider the general condition of our country and look over the force of traveling men we have collected together, the immense stock of goods that we have to sell from, our facilities for filling orders, I feel that the field is broad, the harvest is ripe, and all that we need is to press forward and success will be our crowning glory."

J. T. Jenkins, treasurer of the company, followed, the toastmaster stating that Mr. Jenkins had had much to do with shaping the policy of this company. He spoke on the subject, "Expansion and Conservatism Reconciled." Among other things he said: "Less than a lifetime has science known that the expansion of steam inside the boiler, with the conservatism of the boiler outside the steam, generates the power that propels the locomotive. This power contains neither steam nor boiler, but it is the production of both. The engineer manipulates the power; the conductor controls the engineer; the train dispatcher directs the conductor. The president is the conservator of the employees, passengers and stockholders. While we retain the present chief executive we need fear no accidents."

W. C. Pollard was the next speaker, and responded to the toast, "My Old Friends and My New Ones," and by the able manner in which he handled his subject proved that he was not only a good salesman but an after dinner speaker as well. The next speaker was Geo. W. Everett, who made an eloquent response to the toast, "The Drummer as a High Liver."

The other toasts responded to were as follows:

N. F. Cheairs: "The Road—Why I Left My Happy Home for You."

F. L. Martin: "The Cutlery Man, In and Out."

Thos. Dale: "The Pleasure of Making Duplicate Invoices."

Russ Vanderford: "Retail Department."

Ernest Hood: "Our Band."

J. A. Chilton: "Our New Building."

Jake Boyles: "A Still Hunt for a Trial Balance."

W. A. Lee: "Our Boys."

C. M. Hood: "Religion in the Hardware Business—Does It Exist?"

W. H. Buchanan: "How I Love My Territory."

Thos. Carcuff: "Amusements on the Road."

Jno. M. Pickard read a poem entitled, "Hardware Melodies."

The young women employees of the office, who could not be present, were remembered in a substantial way by the company.

The responses to the toasts were able and interesting. Throughout the evening there was a flow of good feeling, and the banquet was enjoyed by every one and pronounced a great success.

Logan-Gregg Hardware Company's Supper.

The annual supper of the employees of the Logan-Gregg Hardware Company, Pittsburgh, was held on Saturday evening, December 30, in the sample room of their warehouse, the rear of the room having been fitted up for the occasion. The supper is a custom with this concern which extends back to their foundation, about 68 years ago, and was originally a forfeit paid by that one of the firm or employees who made the poorest estimate as to the amount of stock on hand at the time of the annual inventory taken at the holidays. However, many years ago the number of employees had so largely increased that the supper has been given by the firm. This year about 65 employees, together with the members of the firm, were present, and having partaken of the eatables provided, the time was spent in the discussion of ways and means to increase the business, and in listening to suggestions for the new year from the heads of the various departments. Music and other entertainments were furnished by a colored quartette. Not the least enjoyable part of the affair was the address by James H. Bissell, the colored orator of the company.

MAX KLAAS, 98 Duane street, New York, manufacturer and importer of Cutlery, has removed to 298 Broadway, near Duane street, where more commodious quarters, better shipping facilities and a more complete line of goods will enable him to respond to the demands of the trade more promptly and satisfactorily than was possible before. J. R. Linn, well known in the Cutlery trade, has become identified with this house during the past year.

GEORGE T. BROWN, who has for the past three years represented the Rochester Stamping Works, Rochester, N. Y., manufacturers of high grade Sheet Metal Goods, has opened a sample room in part of Neal & Brinker's Hardware store, 18 Warren street, New York, where he has a full line of samples of the Rochester Silver-Nickeled Ware and all other goods made by this firm. Mr. Brown is well known to the buyers of House Furnishing Goods, as he has been selling goods in this market for years. He is a member of the Pottery, Glass and Brass Salesmen's Association.

REVIEW OF HARDWARE MARKET IN 1899.

CHICAGO HARDWARE TRADE IN 1899.

The year just ended was one of the most satisfactory, if indeed it was not in every respect the best, ever enjoyed by the Chicago Hardware trade. The demand for all kinds of merchandise exceeded anything previously experienced, and the advance in prices could hardly have been made more opportunely.

JOBBERS PROFITED.—Jobbers were well supplied with stocks or contracts made at low rates, and reaped great benefit from the subsequent rapid appreciation in values. They also profited largely from the closer relations established between important branches of manufacturing and the jobbing interests. Whatever opinion may be held on the general question of the establishment of great industrial consolidations, the fact must be admitted that jobbers have not for years had such an opportunity to get profits on staple goods. Their trade has been less interfered with by manufacturers selling direct to retailers. Consequently a very considerable portion of their business which has heretofore been conducted at cost on some lines was the past year as productive of profit as any other lines.

A REMARKABLE YEAR.—The year was a remarkable one throughout. It opened with a demand for goods which could not be held back until traveling salesmen began to make their calls after their annual assemblage at headquarters. Orders poured in by mail, buying being stimulated by the pronounced upward movement of prices and the general warning from authentic sources that the approach of spring would find manufacturers utterly unable to make prompt deliveries of seasonable goods.

CONFIDENCE OF RETAILERS.—Furthermore, the retail trade had no fear of a lack of demand from their customers, because the country was never in more favorable condition for a large consumption of all kinds of goods. Farmers had been blessed with a succession of good crops, which had been marketed at very remunerative prices, and the Northwest was "chin deep with prosperity," as stated by an enthusiast of that section.

SAFE BUYING.—As advances were made by manufacturers in rapid succession, the novel experience of prices much above the level of the previous five or six years caused buying to be done cautiously for fear of a reaction. This proved to be an excellent thing for trade as a whole, although, as it happened, not the most profitable thing for retailers. The future not being anticipated, the demand was continuous; orders poured into jobbing houses in a steady stream, and manufacturers' advances were immediately made effective down the entire line. For months the upward movement of prices continued, stimulated by the scarcity and steadily advancing cost of raw materials, and jobbers were often much at sea in trying to keep track of changes.

A TEMPORARY HALT.—April saw the first check to the advancing tide. Reports were circulated of great damage to winter wheat, and unseasonably cold weather cut down the movement of goods due to be heavily bought at this time. Manufacturers using stock of a character easily marketed through the Hardware trade fancied themselves overstocked and endeavored to unload at lower than current prices.

FORWARD MOVEMENT.—But with the advent of more balmy weather all unfavorable influences disappeared, and the movement of goods increased until, in June, it became phenomenally heavy. Scarcity was reported in almost everything. Jobbers were unable to get deliveries from factories fast enough to keep their customers more than partly supplied. Advancing prices had no adverse effect on trade, but on the contrary each advance seemed to stimulate buying.

MISCELLANEOUS HARDWARE.—Sharp advances on a long line of miscellaneous Hardware were made July 1 by numerous manufacturers whose price-lists are usually issued twice a year. Jobbers were less disturbed by such advances than by the difficulty experienced in getting goods to serve their customers. The demand from the retail trade kept up wonderfully. Packing forces were obliged to work at night, although trade was usually dull in other years at the corresponding time. The activity in building throughout the Northwest caused a heavy trade in all kinds of Building Supplies, Builders' Hardware, Mechanics' Tools, &c.

PACIFIC COAST TRADE.—About this time an effort which had been made to change freight ratings on the transcontinental railroads, so as to practically exclude Chicago and St. Louis jobbers from participating in the Pacific Coast trade, proved unsuccessful and relations in that territory were continued.

SUMMER BUSINESS.—The summer months made a glorious record in volume of business, being freed from all unfavorable influences. The wheat crop was not a heavy one, but was far from being a failure, while the prospects for the corn crop were of a most favorable character. Hence business kept up remarkably through the summer, which is usually a period of comparative quiet. Notwithstanding the greatly advanced prices, numerous ventures in the retail trade were made during the summer, the filling of orders for entirely new stocks being of frequent occurrence.

A GREAT FALL TRADE.—The last quarter of the year did not suffer by comparison with previous months. October was especially active. Railroads were gorged with the movement of merchandise, of which Hardware formed a conspicuous part. Jobbers were prevented from doing business up to their full capacity by inability on the one hand of manufacturers to keep them supplied and the impossibility on the other hand of securing adequate railroad service. The shortage of cars, from which all transportation systems suffered, caused jobbers double trouble, both in getting goods from factories and in making shipments to their customers.

SPRING GOODS.—Large advance orders were entered unusually early for goods for spring delivery, buyers being prompted to do so by their experience for several seasons in finding the supply of seasonable merchandise running short by reason of the excessive demand. They found themselves in this very plight as to the supply of winter goods for the season just opening. Changes in price were not so numerous as earlier in the year, but the upward movement continued, nevertheless, and scarcely a week passed but some change of considerable importance was noted. Naturally, the volume of business diminished to some extent in December, but not sufficiently to make trade dull. Some houses have found it equal to if not beyond the best months of 1898.

THE HARDWARE MARKET IN 1899.

We give in the following pages a somewhat detailed review of the changes which took place during the year in a number of leading lines, which fairly represents the course of the market as a whole:

Wire Nails, Barb Wire, Etc.

A review of the Wire Nail and Wire trades for 1899 must be confined almost exclusively to the operations of the American Steel & Wire Company during this year. In the early part of January this concern took over Oliver Wire Company, Oliver & Snyder Steel Company, Pittsburgh Wire Company, all in the Pittsburgh district, and Shenango Valley Steel Company, at New Castle, Pa. The acquisition of these plants gave this concern practically absolute control of the Wire Rod, Wire Nail and Wire trades in the United States, and the market for the past year has been without the usual commercial features

developing from competition among manufacturers. The few concerns not absorbed by that company were not aggressive, but kept their prices close to those announced from time to time by the leading maker. A record of the prices prevailing during the year has therefore been more easily kept than when a large number of manufacturers were actively competing with one another and often making rates to meet exigencies. The year could hardly have opened with conditions more favorable for the manufacturers than those existing. The jobbers, with remarkably few exceptions, had been under the impression early in the winter that prices would be much lower in December, 1898, and hastened to unload on the retail trade. Meanwhile the absorption of other Wire companies was being made by the American, and when jobbers sought to replace their stock they were obliged to pay considerably more than they had expected. They also found the company quoting prices for the month's delivery only, and not taking contracts for the future. This policy was continued, thus preventing the accumulation of very large stocks in the hands of distributers and keeping the market pretty closely under the control of the manufacturers. In the spring the usual terms of 60 days with 2 per cent. discount for cash in 10 days were changed to 30 days net cash. Another change of great importance made in the fall was the advance on Painted Barb Wire to a difference of only 15 cents per 100 pounds between it and Galvanized Barb Wire, which increased the proportion of the latter in the aggregate sales of Barb Fencing. A third change of considerable moment was the adoption of Pittsburgh as the point for a base price, to which freight rates were added to all points of delivery. A great increase was made during the year in the quantity of Woven Wire Fencing marketed. In this trade quite a large number of independent companies operated, although a very heavy product was turned out by the factories of the American Steel & Wire Company. The prices of Wire Nails and other Wire products advanced every month in the year until October, keeping pace with advances in the cost of Pig Iron and Steel Billets, and another advance of 25 cents was made under date December 30.

The year opened with Wire Nails about $1.35; Galvanized Barb Wire, $1.80, and Plain Wire, $1.20, all f.o.b. at mill. By January 15 an advance was made of 10 cents per 100 pounds, and on January 23 another advance was made of 5 cents per 100 pounds, bringing the price of Wire Nails to $1.50; Barb, $1.95, and Plain, $1.35. On February 1 another advance of 10 cents was made, and on February 27 a further advance of 25 cents per 100 pounds, which put the price of Wire Nails at $1.85; Barb Wire, $2.35, and Plain Wire, $1.70. On March 12 an advance of $3 a ton was made, which put the price of Wire Nails to $2; Barb Wire, $2.50, and Plain Wire, $1.85. There was no further change in prices until April 17, when another advance of 10 cents per 100 pounds was made. Almost two months elapsed before prices were put up again, but on June 1, when the boom was on in all departments of the Iron trade, the American Steel & Wire Company made an advance of $5 a ton on Nails and Wire, which made the price of Wire Nails $2.35, Barb Wire $2.95 and Plain Wire $2.20. On July 17 an advance of 15 cents was made, and on September 1 another advance of 15 cents. This made the price of Wire Nails on that date $2.65; Barb Wire, $3.25, and Plain Wire, $2.50. These prices, however, remained in force only until September 11, when another advance of $3 a ton was made, and this was followed by a smaller advance on October 17, which made the price of Wire Nails to jobbers $2.95 in carload lots; Barb Wire, $3.55, and Plain Wire, $2.80. No further advances in prices were made during balance of the year, until December 30, when the price was put up 25 cents. The tonnage in Wire and Wire Nails of 1899 was very much the largest in the history of the trade. The exports of their products during the year by the American Steel & Wire Company have been large, and trade in this direction is constantly extending.

CHICAGO WIRE NAIL PRICES.

The course of prices of single carload lots at Chicago during 1899 and for several years preceding is shown in the following table, the monthly prices being averaged from weekly quotations in our market reports:

Months.	1899.	1898.	1897.	1896.	1895.	1894.	1893.
January	$1.59	$1.55	$1.50	$2.42	$0.95	$1.17½	$1.57½
February	1.73	1.57	1.45	2.42	0.95	1.20	1.55
March	2.09	1.55	1.50	2.57	1.00	1.15	1.65
April	2.25	1.47	1.45	2.55	0.95	1.00	1.65
May	2.35	1.45	1.42½	2.70	1.10	1.07½	1.60
June	2.60	1.43	1.42½	2.70	1.50	1.20	1.50
July	2.70	1.36	1.35	2.70	1.95	1.20	1.47½
August	2.80	1.36	1.37½	2.70	2.20	1.15	1.47½
September	3.10	1.45	1.50	2.70	2.40	1.10	1.47½
October	3.20	1.47½	1.52½	2.70	2.40	1.05	1.40
November	3.28	1.40	1.50	2.70	2.42½	1.05	1.30
December	3.53	1.37½	1.50	1.60	2.42½	1.00	1.27½
Average for year	$2.60	$1.45	$1.46	$2.54	$1.68¾	$1.11¼	$1.50

CHICAGO BARB WIRE PRICES.

The course of prices of Galvanized Barb Wire, in single carload lots, Chicago delivery or equal, has been as follows in the past seven years, our weekly quotations being averaged:

Months.	1899.	1898.	1897.	1896.	1895.	1894.	1893.
January.	$2.05	$1.90	$1.90	$2.02½	$1 90	$2.25	$2.65
February	2.25	1.90	1.85	1.97½	1.90	2.25	2.60
March	2.62½	1.90	1.90	1.95	1.95	2.30	2.60
April	2 80	1.87½	1.80	2.05	1.90	2.20	2.60
May	2.95	1.80	1.80	2.15	1.95	2.15	2.60
June	3.20	1.80	1.75	2.00	2.10	2.20	2.55
July	3.30	1.80	1.75	2.00	2.15	2.25	2.52½
August	3.40	1.80	1.65	1.90	5.55	2.25	2.50
September	3.67½	1.80	1.80	1.85	2.85	2.20	2.45
October	3.77½	1.82½	1.80	1.85	2.85	2.15	2.40
November	3.88	1.82½	1.80	1.85	2.85	2.00	2.40
December	4.13	1.82½	1.80	1.95	2.00	1.90	2.35
Average for year	$3.17	$1.85	$1.80	$1.96	$2.25	$2.18	$2.55

The Cut Nail Market.

Although by far the greater part of the Nails sold consisted of Wire Nails, the demand for Cut Nails, as well as prices, showed a marked improvement in 1899 as compared with 1898. The price followed the Wire Nail market very closely. The year opened with the price of Cut Nails $1.10 in carload lots, f.o.b. at mill, and prices were steadily advanced during the year, generally closely following the advances in Wire Nails, until $2.50 per keg, f.o b. mill, Wheeling, was reached. The volume of business in Cut Nails during 1899 has been large and the average of prices high, giving the Cut Nail mills a very satisfactory profit.

The general course of the market is indicated in the following review of the prices current in Chicago during the year:

PRICES OF CUT NAILS IN CHICAGO.

In the year 1898 jobbers' prices on Cut Nails ranged from $1.47½, when the highest point was reached in March, to $1.35, the rate from May to December. The average monthly quotations from jobbers' stocks in Chicago during 1899 were as follows:

Months.	Price.	Months.	Price
January	$1.40	July	$2.30
February	1.40	August	2.35
March	1.65	September	2.55
April	1.85	October	2.70
May	1.90	November	2.80
June	2.00	December	2.80

The average price for the year was $2.15.

Building Papers.

Building Papers, by which is understood Rosin-Sized Sheathings, Water Proof Sheathings, Deafening Felts, Tarred Roofing Paper, &c., in all the many thicknesses, weights and kinds, sold in greater volume last year than ever before, especially during the latter part of the year. All the manufacturers of this commodity have had all the business they could take care of in the last three months. As a result of the larger demand and increases in raw materials, prices have shown a tendency to advance. The confidence of the trade in the immediate future is such that manufacturers are not offering any inducements to buyers now, or encouraging speculative contracts, although prepared to supply current demands.

The trade last spring was fair; that of the summer not much of an improvement on the spring business,

while the fall orders were exceptionally good. Several new plants have taken up the manufacture of these Papers, but the increased consumption has been more than enough to absorb the increased output, speaking of the latter half of the year.

The newer concerns in this expanding business are the York Haven Paper Company, 9-13 Broadway, New York (old at Paper making but new in this department); James Lyons, Evergreens, L. I., and a chemical company in Pittsburgh. For a term of years this business has been controlled by the Barrett Mfg. Company, who have branches in ten or a dozen cities, and are a consolidation of about five smaller combinations that for 10 or 12 years have been amalgamating. The centralizing tendencies of this trade have resulted in the Barrett Company taking in their strongest competitor by absorbing the National Coal Tar Company, followed by absorption also of the Warren Chemical & Mfg. Company.

Rope.

The year past has seen rapid advances in Cordage, especially during the last six months. The range in prices of Rope has been large, the extremes for less than carload lots being as follows:

	January.	December.
Manila, 7-16-inch and larger	7¼ cents.	15½ cents.
Sisal, 7-16-inch and larger	7 cents.	10 cents.

Toward the last of January Manila Hemp was difficult to obtain, owing to the unsettled condition of affairs in the Philippines. At that time it was estimated that there was enough Hemp afloat to supply requirements for 90 days, which, after arrival, would cover manufacturers' needs for the months of March, April and May. During February large contract orders were placed by jobbers with manufacturers. In March and April the advances in price made by the manufacturers amounted to 2 cents per pound. These prices ruled during the early part of May and were considered high by the retail trade and as offering little inducement to buying. During May and June jobbers were shading manufacturers' prices ½ to ¾ cent per pound. By the middle of July Manila Rope had advanced to a basis of 10 cents and Sisal to 8½ cents per pound, with a good demand for summer months. During August, September and October advances were frequent and from ½ cent to 1 cent at a time, without apparently restricting the distribution of Rope. By the middle of November prices had reached their present level of 15½ cents for Manila and 10½ cents for Sisal. During the last three months of the year the high prices of Manila and Sisal Rope brought into prominence other hemps for Rope, particularly Jute, for which there was an active demand. Jute Rope has now reached 6¼ to 7 cents per pound, according to quality, and prompt deliveries are difficult to obtain. The opening of some of the Philippine ports during the present month is expected to affect the Manila Hemp market in the near future, when Sisal Hemp will naturally decline in value. As manufacturers' stocks are low, early demand may have the effect of sustaining their prices for a while.

Glass.

At the commencement of the present year the American Glass Company, who had been in existence for a little over two years, controlled to a large extent the Window Glass market of the country. The Glass list which took effect January 1, 1898, was in force, this being the one now in use. The division of the country into districts, made in April, 1898, was the basis of quotations on January 1, 1899, and the prices of Glass in various quantities were represented by the following discounts, with freight allowance:

Districts.	A	B	C	D	E
5000 boxes or more	85 & 10 & 5	85 & 10 & 5	.....	.....	85 & 10
Carloads	85 & 5	85 & 5	85 & 5 & 2½	.....	85
3000 boxes or more	85 & 10	85 & 10	.....	.....	85 & 5 & 2½
1000 boxes or more	.....	.....	85 & 10 & 2½	.....	.....

Early in January an inducement to early buyers took the form of a rebate of 25 per cent. discount from the foregoing prices for double strength and 15 per cent. discount for single strength Glass to all buyers of 5000 boxes or more. This privilege was originally designed to cover about three weeks, but was extended under varied conditions and with reductions in the amount of rebates until the last of June. The policy pursued by the trust throughout the entire year has been to force independent Glass companies to join the proposed new combine, which was finally organized in the fall, under the name of the American Window Glass Company, taking the place of the American Glass Company. They failed in this attempt, however, in the majority of cases, as the trust is now supposed to control only about 60 per cent. of the entire productive capacity of the country. The price of Glass was advanced by the trust at various times during the year until the first part of December, when prices were on the basis of 85 per cent. discount for 5000 boxes or more in district A, against 85 and 10 and 5 per cent. discount at the beginning of the year. At the close of the fire June 29 it was estimated that the combined factories held a stock of from 1,000,000 to 1,250,000 boxes of Glass. During the summer and early fall months the usual dilatory proceedings in adjusting the wage scale were carried on by the combine. A large number of independent and co-operative factories were in operation by November 1, but the combined factories did not start until January 2.

In November the National Window Glass Jobbers' Association was formed, for the primary purpose of preventing an open market and ruinous competition. Finding all other expediencies had failed to obtain control of the market, the combine, about the middle of December, announced the reduction of carload prices to 90 per cent. discount for single and 90 and 10 per cent. discount for double strength Glass. To what lengths the effort to control the market will carry the trust remains to be seen. The fact is patent that present prices for Glass are extremely low ones.

It is noticeable that Glass has the distinction of being one of the very few lines prices on which are lower than at the opening of the year.

Binder Twine.

The trend of the Binder Twine market naturally followed that of Rope and advances in prices were frequent. The market opened in January under a rather unusual condition, that of manufacturers guaranteeing prices to within a short time of delivery. This stimulated the placing of orders with manufacturers. The market at that time was weak on the basis of 8½ to 8¾ cents per pound for white Sisal Twine, 500 feet to the pound, while guaranteed prices made quotations of little value. The first part of February saw a stiffer market, owing to higher Hemp prices, and by the middle of the month orders were accepted by manufacturers rather than sought. By April 1 white Sisal Twine had advanced to 9⅜ cents per pound, and by the last of the month some Eastern factories had withdrawn quotations and were making no prices, having orders for all the Twine they could produce in the immediate future, even by running overtime. The last of May found a number of mills running overtime to fill contract orders. Some jobbers were quoting lower figures on such grades as they had on hand, subject to stock. At the beginning of June manufacturers were still holding white Sisal Twine at 9⅜ cents per pound, but by the last of the month a break had occurred in values in some sections of the country, and manufacturers and jobbers were making a price of 8 to 8½ cents for white Sisal.

Turpentine.

Prices of Turpentine have fluctuated considerably during the year, being lowest the middle of June and highest the middle of October. The prices given represent the New York market:

	June 15.	October 19
Southerns	38 cents.	53½ cents.
Machine made barrels	38½ cents.	54 cents.

From January until June prices for machines ranged from 42 to 48 cents. During the last of April the new crop of Turpentine began coming in quite freely, and this, together with the withdrawal of large buyers, caused a drop in the price of machines to 38½ cents. The market recovered during the next month, and early in August a report of a short crop stimulated foreign and domestic buying. Later in the month a severe storm in the South, large estimated contract requirements and small local offerings brought machines up to 52 cents. Prices declined again in September, but increased demand and scarcity of freight room from the South brought machines up to 54 cents during October, this being the highest figure reached by Turpentine in recent years. From that time until the end of the year the price of machines ranged from 51¼ to 52 cents.

White Lead.

During the year but two changes have been made by manufacturers in the price of White Lead in oil. This is remarkable considering the rapid and frequent advances in other lines of goods. The year has been one of large distribution of Lead, particularly in the West. Prices at the beginning of the year were as follows: In less than 500-pound lots, 6 cents; in lots of 500 pounds and over, 5½ cents per pound. The last part of August an advance of ½ cent per pound was made, bringing the price up to 6½ and 6 cents, according to quantity. This price ruled until December 11, when an advance was made to 6¾ and 6¼ cents, according to quantity. January and February developed an unusually large demand for both nearby and future deliveries. Consumptive demand during the last of April was light, but increased in May under improved weather conditions and continued good through June. July and a part of August proved to be quiet periods in this line, but from the first of September until the middle of November demand was large. Since that time distribution has naturally been light. The year closed with prices 6¾ and 6¼ cents, according to quantity. Manufacturers review the year's business with satisfaction.

Stocks and Dies, Etc.

Manufacturers are reasonably contented with the year's business, which has been of large volume at prices some distance from the cost line. Several efforts were made to secure an advance in prices of Taps and Dies, in view of the fact that material had advanced sharply, but it was found impossible to effect an agreement among the manufacturers. The result has been that prices have ruled as low as heretofore, with a tendency on account of competition to go lower, so that it is stated that Taps and Dies are selling at lower prices to-day than a year ago.

Coil Chain, Etc.

This is one of the lines in which the market has presented an almost constant series of changes in view of the heavy demand, advancing prices and the negotiations relating to consolidation of manufacturing interests. The year opened with prices at a very low level, competition having forced quotations down to unprofitable figures, but in January higher prices began to be named, and while there was no regularity in the quotations of the different manufacturers representative prices were advanced about 10 per cent., as illustrated in the price of ¾-inch Coil Chain, which was sold at the opening of the month for $1.80 per 100 pounds, and at the close for $2. During the next month the advances were more radical, and by May 1 the market was represented by the quotation of $2.80 for ¾-inch Coil. Negotiations had for some time been progressing with a view to the consolidation of the interests of Chain manufacturers, and the success attending them was indicated in greater regularity in quotations. The provision by which a difference of 10 cents per 100 pounds was made between carload and less than carload lots was put into effect more generally than previously, and has been continued quite steadily up to this time. During the subsequent months the market moved rapidly upward as indicated by the following prices, which prevailed at the dates named, there having been some intermediate changes which it is not necessary to specify particularly:

May 1.—¾-inch coil, cask lots	$2.80
May 12.—¾-inch coil, cask lots	3.20
May 26.—¾-inch coil, cask lots	3.50
June 8.—¾-inch coil, cask lots	3.75
July 20.—¾-inch coil, cask lots	4.00
September 12.—¾-inch coil, cask lots	4.25
October 6.—¾-inch coil, cask lots	4.60

The organization of the Standard Chain Company was announced as the result of the negotiations above referrerd to. This was a consolidation of 13 Chain factories, including most of the prominent ones. Some important concerns, however, remained outside. The work connected with the consolidation actively progressed, but of late rumors have been current that some difficulties have delayed the final consummation of the plan. The market, however, is characterized by a strong tone with a large demand, which makes it difficult for the manufacturers to supply goods as fast as required by the trade.

Axles.

The demand for Wagon Axles during the year was unusually good, and, on the whole, trade was very satisfactory to the manufacturers. In the early months of the year dealers and consumers were ordering largely to take advantage of the price then ruling, as indications were that prices would be higher before long. There was no general advance in the price of these goods until April 29, and this advance was a very moderate one to cover the increased cost of material. Another advance was made August 24 to keep pace with the continued advance in Steel and Iron, but the advance was not sufficient to cover any large increase in wages or to leave manufacturers a much wider margin of profit than at the opening of the year. The factories have been fully occupied for the greater part of the year, which closes with an excellent outlook for future trade. One gratifying feature is the fact that the trade have been calling for the better goods in larger proportions than formerly, indicating the more prosperous conditions prevailing throughout the country and especially in the West. Orders for next season have been freely placed, and it is said that the indications are that deliveries will be called for earlier than usual.

Common Carriage Bolts.

This market has shown extraordinary changes during the year and until the last month there has been a rapid and steady advance in prices. At the time this review opens the market to large buyers was represented by the quotation of discount 80 and 7½ per cent. on Common Carriage Bolts, and at its close by discount 45 and 5 and 10 per cent., an advance of more than 150 per cent. The upward movement began early in January, but prices had not yet become regular, there being a good deal of diversity in the quotations of the various manufacturers. Without attempting to follow in detail all the changes of the upward movement, the following points may be recalled: March 1 the price was represented by discount 70 and 15 and 10 per cent., a further advance of 10 per cent. being made that month; with the opening of June the discount was 65 and 10 per cent., but before the end of the month the base price was advanced to 60 per cent.; in July the market was 50 and 10 and 10 per cent., at which figure it remained steady until in September an advance of 10 per cent. was made, making the quotation discount 50 and 10, a price which was adhered to until that now ruling for larger buyers was established in November—namely, discount 45 and 5 and 10 per cent.

Some advances were made in the lines of Bolt Ends, Machine Bolts, Lag Screws, &c., the course of which is sufficiently indicated by the above review. A new list on Coach and Lag Screws was adopted, going into effect October 1.

A revised list of Philadelphia Eagle Carriage Bolts was adopted by the manufacturers under date May 24.

During the year the demand was very heavy, and the capacity of the manufacturers has been taxed to the utmost. Notwithstanding the radical advance in price the year's business has not in all respects been satisfactory to all the manufacturers, inasmuch as some of them were loaded up with very large orders at very low prices, and it is understood that until nearly the close of the year shipments have been made at prices ruling in January or February. In the early part of the year there was a great deal of cutting of price by the jobbers, whose large stocks purchased at extremely low figures enabled them to undersell the manufacturers. There has been less of this in the last month or two, as the jobbers' stocks have been more or less depleted, and in some cases something of a scarcity has developed in the market.

An important consolidation of interests in this line was effected by which a number of leading plants were brought under single control. This consolidation is known as the American Iron & Steel Mfg. Company, who own and operate the works formerly owned by J. H. Sternbergh & Son and National Bolt, Nut and Rivet Works, both of Reading, Pa., and Lebanon Iron Company, East Lebanon Iron Company and Pennsylvania Bolt & Nut Company, all of Lebanon, Pa.

Wood Screws.

Wood Screws being directly affected by the increased cost of the raw material, have been rapidly advanced. Apart from the necessity for such action on account of the prices of Iron and Brass, the manufacturers were enabled to act together through a strong organization in which practically all of them are united. The fact that low prices had for several years been current doubtless also had its influence in making the manufacturers desirous of taking advantage of improved conditions, and as a result of all these causes prices are materially higher than a year ago. The advance in the prices of Brass Screws was first made on account of the high prices ruling for the raw material, but the base price of Iron Screws was gradually advanced from discount 87½ per cent., which was in force on January 1, 1899, to discount 80 per cent., the price at which the year closed. While manufacturers were enabled to maintain prices very firmly there has been more or less cutting by the jobbers, and of late there has been a more evident disposition on their part to give liberal concessions below the prices which manufacturers are giving to the smaller trade. As noted in another column, a new list for Iron Screws has been adopted under date January 1, 1900, which is somewhat higher than the old list, the base discount remaining without change. A slight advance thus goes into effect with the new year.

Horseshoes.

The Horseshoe market has witnessed several advances during the year, but this is a matter in which the manufacturers have been very conservative. Prices at the close of the year are represented by the quotation of $3.70 per 100 pounds on Burden's, and $3.75 for Rhode Island Perkins, Phœnix, American, Bryden, Eagle and Standard Horseshoes, the Diamond State, Tredegar, Old Dominion, Shoenberger and Crescent Shoes being quoted at $3.75, subject to a discount of 5 per cent.

Tacks.

The year past was one of repeated advances in the price of Tacks by manufacturers, among whom there was a better understanding and more harmony of action than in former years. The market has, however, been characterized by some irregularity in quotations. There has been a large demand. At the beginning of the year the price of Tack Plate advanced rapidly, but most manufacturers had taken contracts at low figures. Many jobbing houses were during the year well stocked with Tacks purchased at low prices, which had its effect in giving some irregularity to the market. This feature was prominent throughout the year. The increased cost of goods made from Brass and Copper lessened their sales, and has brought brassed and coppered goods largely into use during the latter part of the year. Advanced prices have also decreased the demand for Wire Finishing Nails. If the price of raw material remains practically unchanged, manufacturers look for a much stiffer market for Tacks.

Files.

The commencement of 1899 saw active competition among File manufacturers, and a consequent yielding of prices, with low quotations. An increasing volume of business during the first five or six months of the year did not result in any perceptible improvement in prices. A revised price-list was announced by the manufacturers taking effect June 1, discounts remaining unchanged, the general effect of which was an advance. In August an advance of 10 per cent. was agreed upon. There was, however, lack of uniformity among manufacturers in the manner of applying this advance. Some added it to the list price, others decreased the former discount, while others added the advance to the net invoice. To correct the confusion thus caused and to keep the discounts unchanged, notwithstanding the advance necessary on account of the increased cost of raw material, a new list was adopted November 1. The new list at the former discounts embodied an advance of 5 to 10 per cent. in price. For several months past the demand has been very large for Files, and has taxed the capacity of the factories. Manufacturers have numerous orders on hand, with large contracts coming in, and with current business deliveries will probably extend beyond the first three or four months of the present year. The tendency of the market is upward, but is not considered to be in proportion to the increased cost of raw material, or to what the demand would warrant. Manufacturers apparently have not realized very ample profits during the year, but are hopeful of better returns during the coming year.

Steel Goods.

At the opening of 1899 there was a good deal of diversity in the lists used by the manufacturers and jobbers in connection with the sale of Steel Goods, but this condition has been, so far as the manufacturers at least are concerned, corrected by the adoption of a new uniform list, which is divided, as before, into a number of groups and subject to an interesting diversity of discounts. Prices are higher than last year, but the manufacturers have been conservative about advancing the goods, and refer to existing prices as lower than they should be in view of the price for Steel, the increased cost of Handles and other things which enter into the cost of producing the goods. The demand for next season has been both early and large, and the manufacturers with few, if any, exceptions have their books filled with orders.

Bright Wire Goods.

There were two changes of list in Bright Wire Goods during 1899. The year opened with a somewhat demoralized condition, as exceedingly low prices were prevalent, yielding little, if any, profit to the manufacturers. The state of the market at the time was represented by the quotation of discount 90 and 30 per cent., which was readily obtainable by the small trade, an extra 10 or more being within the reach of large buyers. Early in the year manufacturers began withdrawing some of their extreme discounts. In February it was necessary to make an advance of something like 20 to 25 per cent. in the price of the Brass, as compared with the Iron goods, on account of the high cost of Brass Wire. This

difference was not, however, in all cases adhered to, and on a good many assorted orders the larger discount was made to apply to the whole. In March a relatively low new list was adopted, subject to a regular printed discount of 40 and 10 per cent. This list, however, did not remain in force long, partly on account of the rapid advance in Wire, which developed inequalities in the list, but principally on account of the contention made by the jobbing trade that a high list would be much more satisfactory. A return was accordingly had to a high list, revised so as to represent conditions then existing, and this list, announced under date July 1, still continues in force. On account of the great advances in Wire this line of goods has witnessed a marked increase in price.

Padlocks.

There were several advances in Padlocks during the year, and the whole line has been put into a substantially improved condition, regarded from the manufacturers' standpoint. The common Wrought Iron Padlocks, which, at the commencement of the year, were sold at a base price of 80 per cent., with extras for quantities, were advanced so that the price to the general trade is now represented by the quotation of discount 70 and 7½ per cent., beyond which there are concessions in larger lots.

The general line of Brass and miscellaneous Padlocks were also brought into a much better condition by an understanding reached by the many manufacturers of these diversified goods. At a conference held in June, at which 16 manufacturers were represented, it was agreed to make advances on the following basis: Padlocks selling at $1 or less to be advanced 20 per cent.; Padlocks selling from $1 to $2 to be advanced 15 per cent.; Padlocks selling from $2 to $3 to be advanced 12½ per cent., and Padlocks selling at $3 or over to be advanced 10 per cent. This agreement was generally carried out, and the understanding thus reached had had a good effect on the market and made subsequent advances feasible. The excellent demand has enabled the manufacturers to obtain good prices, and while there has been no very radical advance in current quotations the market on this line is regarded by the manufacturers as being in good condition.

Nuts.

The market for Nuts, both Hot Pressed and Cold Punched, developed strength early in the year and began advancing in January, continuing the upward movement until manufacturers' current prices were represented by the quotation of 4.50 cents off list on large lots of Hot Pressed Square. The volume of business was very heavy, and the year closed with most of the mills full of orders and a strong tone prevailing in the market.

Cabinet Locks.

Cabinet Locks experienced comparatively few changes during the year. An advance was made by the associated manufacturers in March, by which the base discount was made 33 1-3 per cent., instead of 45 per cent., as before, and this price has been steadily maintained by them. There has been a little disturbance of current quotations on account of the frequency with which jobbers gave an extra 7½ or 10 per cent. Business has been good in this line, but manufacturers have not been as much pressed with orders as in more staple lines, in which the cost of the material is a larger element of the cost.

Shovels and Spades.

This line, which entered on the year in excellent condition under the control of the association, has continued to be characterized by a firm maintenance of prices and a large demand. Three advances were made during the year, one of 75 cents per dozen and two others of 50 cents each. Outside competition interferes very little with the control of the market by the associated manufacturers. On account of the prices some foreign trade is apparently being lost, but to hold this business lower prices are made to foreign than to domestic buyers. Business has been in large volume, and the factories are taxed to the utmost capacity to supply the demands of the trade.

Poultry Netting Staples, Double Pointed Tacks, Etc.

Early in the year the manufacturers working together made a number of advances in the price of Poultry Netting Staples, Blind Staples, &c., and for a while the market was, from the manufacturers' point of view, in a very satisfactory condition, the demand being active and prices remunerative. This condition of things induced some new manufacturers to enter the field, and as a result Poultry Netting Staples, Double Pointed Tacks, &c., have recently developed much irregularity in price and quotations are reduced to a level which, it is claimed, makes the manufacture of the goods unprofitable. As one of the manufacturers facetiously expresses it, "these goods are to-day sold at about the cost of production, and there is nothing in sight to improve the situation. The winter winds will not only blow through the whiskers of the Double-Pointed Tack maker, but it will search out his anatomy through his summer clothes."

Iron Rivets.

As directly affected by the increased price of the raw material Iron Rivets are substantially higher than at the beginning of 1899. A new list went into effect under date May 10 and is still in force. The volume of business has been large, and manufacturers have been in a position to maintain prices steadily.

Wood Planes.

Wood Planes have not felt the influence of advancing prices as much as many lines and the manufacturers have not been as heavily pressed with orders. Business, however, has been of good volume and at least two advances have been made.

Steel and Iron Squares.

Early in the year there was a reaction from the low prices developed on Steel and Iron Squares, the market on which at the opening of the year was represented in a general way by discount 75 and 10 to 80 and 5 per cent. At the close of the year the printed discount was 65 and 10 per cent., and the market is represented by the quotation of 70 per cent. in less than case lots, and 70 and 5 per cent. in case lots. Throughout the year, however, there has been more or less shading of manufacturers' prices by the jobbers.

Chisels.

During the year the manufacturers of Socket Chisels worked together in harmony and succeeded in giving the market a good deal of regularity so far as manufacturers are concerned. The year opened with a somewhat unsatisfactory condition of things, the goods selling at even better than discount 80 and 10 and 5 per cent. on certain brands to the larger buyers. A number of advances were made, the market closing in December with a price to the retail trade of discount 70 and 10 and 2½ per cent. This is one of the lines on which the jobbing trade were quite heavily stocked with goods and during the year they have frequently undersold the manufacturers. The condition is referred to by the manufacturers as in the main satisfactory, with a good prospect for an excellent trade during the present year.

Egg Beaters.

The prices for Egg Beaters last January were low and somewhat irregular, but the market soon became firm and showed an advancing tendency on account of liberal buying by the trade and the higher prices of raw materials. Several advances thus resulted, but manufacturers complain that the prices ruling during the year have not paid them fair profits. They are, however, acting together and further advances are not unlikely. An increase in export business has been a feature in this line during the year.

Pumps.

A new list on Pitcher Spout Pumps was announced early in January of last year. This was later revised, this action being necessary by the advance in material. The result was better market conditions than for some time. The advances in prices throughout the year made necessary by increased cost in material, and the great increase in the cost of Wrought Iron Pipe used in the installation of Well Pumps, especially in the country, has restricted the demand for Pitcher, Well, Wind Mill and like Pumps to a perceptible degree. While manufacturers have been busy they have not been crowded in the departments devoted to the lines named. The demand for Power Pumps has been active and has necessitated working overtime in some plants, and prospects appear good for a fair trade during the present year.

Augers and Bits.

Low prices were current for common Augers and Bits during the early months of 1899. At the beginning of the year prices were very much demoralized and with the active competition existing manufacturers took orders freely, many of which lasted through the year, some it is estimated being still unfilled. While advances have been made in prices from time to time to meet increased cost of materials, the concessions offered by jobbers who had contracted for goods at the low prices, and competition of the cheaper or second quality goods, have had a disturbing effect upon the market. During the larger part of the year there has been a demand for all the goods that could be made. It is assumed that manufacturers have limited stocks on hand. Prospects seem good for a large business this year, and at better prices than in the year which has closed.

Rules.

The market for Boxwood Rules previous to 1899 had been in an unsatisfactory condition, prices being represented by discount 80 per cent., with an extra six or even seven 10's to large buyers. Early in the year the base discount was changed from 80 per cent. to 75 per cent., a discount which continues to be the basis of quotations, a series of extra 10's being given as before, but not quite so liberally.

Linseed Oil.

The year has seen sudden advances and equally sudden declines in the Linseed Oil market, covering a range of 13 cents between the lowest and highest prices. The extremes were reached in August and December, as shown by the following prices of City Raw:

	August.	December.
In lots of less than 5 barrels	38 cents.	51 cents.
Five barrels or more	37 cents.	50 cents.

State and Western brands have been usually held at 1 to 2 cents below the price of City crushed Oil. The year opened with City Raw at 42 to 41 cents, according to quantity, and the market continued at these prices until the middle of March, when an advance of 2 cents was made. Two more advances of 2 cents each were made before the end of March, bringing prices to 48 to 47 cents. The assumption that Oil would make further advances before a decline took place brought large buyers into the market to cover their requirements at these figures. By the middle of April prices had reached 50 to 49 cents. The early part of May saw a fair demand for small lots for immediate shipments, and crushers busy on contract deliveries. By the middle of the month manipulation of the Flaxseed market in the West had unsettled the Oil market, which was followed the last of May by a reduction of 6 cents per gallon in the price of City Raw, bringing the price to 39 to 40 cents. This resulted in a demoralized market, and out of town brands were sold at 3 to 4 cents below these prices. Sales were also reported at this time of large lots in tanks for 1900 delivery at from 32 to 34 cents per gallon. Out of town brands continued so low in price that City Raw was reduced to 38 to 37 cents on August 9, to make prices correspond more nearly with the out of town brands. The market recovered toward the last of the month under reports of scarcity of spot Oil and advance in the price of seed, and by the middle of September City Raw was quoted at 45 to 44 cents. After a decline of 4 cents in the early part of October, the Oil market gradually advanced, as the result of a strong seed market, until, on December 6, it reached 51 to 50 cents. The impression prevails that the high price of seed is the result of unnatural causes.

Wrought Iron Pipe.

A retrospect of the past year, reviewing the prime features of the market in Tubular Goods, embracing Merchant Pipe, Boiler Tubes and Oil Country goods, records a very much greater tonnage produced and marketed at higher prices than ever before, abundantly justifying the forecast in these columns January 5, 1899.

Following the month of December, 1898, which in itself was a record breaker in the Wrought Iron Pipe trade, both as related to mill shipments and tonnage entered, the New Year gave promise of the heaviest tonnage ever known. Merchant Pipe was then quoted as follows: Butt Black, 55 per cent. discount; Lap Black, 65 per cent.; Butt Galvanized, 45 per cent.; Lap Galvanized, 50 per cent. base, with five 10's, 7½ and 5 per cent. for car lots delivered. Oil Country goods, such as Screw and Socket Joint Casing, were quoted at 60 per cent. discount, and Inserted Joint at 60 and 10 per cent., with an extra 2½ per cent. to dealers. Boiler Tubes were variously quoted at 60 and 5, 72½ and 5, and 75 and 5 per cent., according to the size.

Early in February leading mills in Pittsburgh territory had booked orders for 6,000,000 to 7,000,000 feet of small pipe. Then advances were made as the product became scarcer, one large mill being then 12 weeks behind in deliveries. By the middle of February the output of the Pipe mills was practically engaged for the ensuing three or four months.

Through a portion of 1898 and a large part of the next year negotiations progressed toward the ultimate taking over of 13 of the leading Tube works plants by what is now known as the National Tube Company, the undertaking being virtually closed about June 1 and possession acquired a month later. Most of the prominent concerns were thus consolidated, but several important interests are outside.

On February 22 a uniform discount was adopted by 17 leading mills, making practically the entire output of the country of Merchant Pipe, both black and galvanized, Butt and Lap Weld, on all of which was quoted the base discount of 60, six 10's and 5 per cent. for car lots delivered.

In March some phenomenal records for production were made, the tonnage of some concerns in Western Pennsylvania far surpassing previous records. It had now become not a question of price, but the finding of a mill with Pipe to sell, all of the mills being sold ahead two to four months.

In April Merchant Pipe was quoted at 60, four 10's and 5 per cent. in carloads.

By the first of May most of the Pipe mills were under option and instructed not to enter orders for delivery after June 1, Merchant Pipe advancing again to 60, three 10's and 5 per cent. in car lots.

In the fore part of June Merchant Pipe sold in lots of 5 and 10 carloads at 60, 10 and 10 per cent., advancing later to 50, 10, 10 and 5 per cent. in carloads.

Later in the month the National Tube Company sent out notices to the different concerns taken over that formal possession would be taken July 1. In the middle of September the mills had orders booked sufficient to keep them going for the next three or four months.

A pleasing feature in connection with this important commodity is the gratifying growth of the export trade, which the National Tube Company are determined to retain.

The exports of this company in the last year have been approximately 50,000 tons, distributed to British Colonies, South America, Central America, Mexico, South Africa and Europe.

The demand for Tubular Goods for 1899 in the United States has been heavy and well diversified in character, showing a prosperous condition in oil district, as well as regular lines—*i. e.*, building, gas line extensions, electrical conduits, &c.

Prices now, compared with former years, are very much higher, a condition unavoidable owing to the enhancement in price of raw materials, supplies and labor.

The prospects for the current year, aside from unforeseen or extraneous conditions at present unknown, are indicated by the desire of large buyers to book tonnage far into the year and at the present range of values, is encouraging.

Copper and Brass Sheets, Wire, Etc.

SHEET COPPER.—The leading staples made entirely or largely of Copper have shown marked advances in price during the past year. In Sheet Copper for a year or a year and a half prior to December 9, 1898, there was no association, it being sold on a basis of about 13½ to 15 cents per pound. On December 9 a new organization was effected when the base was fixed at 16½ cents, advancing on January 19, 1899, to 18½ cents, followed on January 24 by an advance of 1 cent a pound to 19½ cents, base. A brief halt occurred, and on February 2, in sympathy with advances in Ingot, a jump of 2 to 21½ cents, base, was made. This figure held until May 2, when another cent was added, making the base 22½ cents per pound, where it still remains, except that on August 22 last Tinned Copper Sheets were put up ½ cent a pound.

COPPER BOTTOMS, Pits and Flats, Bolt Copper and Soldering Coppers being classed in the same group naturally recorded like advances. On January 24 Bottoms, Pits and Flats were advanced to 23½ cents, base, and on February 2 a further advance of 2 cents a pound to 25½ cents, base, was made, Bolt Copper being likewise raised to 21½ cents on February 2 and 22½ cents on May 2, Soldering Coppers making a relative advance.

COPPER RIVETS AND BURS.—A single change in price in Copper Rivets and Burs was made by the manufacturers on February 1, when from 60 per cent. discount the price was put up to 50 per cent., Burs only 35 per cent., at which figure they have since remained.

COPPER WIRE.—Bare Copper Wire in the middle of January was 17 cents, base, but on January 23 was moved up to 18 cents, base, Insulated Wires making relative gains. February 1 saw another upward movement of 1 cent a pound in the various groups of Hard and Soft Drawn, Tinned, Weather Proof and kindred Copper Wires. Two days later on February 3 another gain of I cent a pound in the price of Copper Wire was made. April witnessed the dissolution of two of the principal combinations in Copper Wire, controlling Hard and Soft Drawn, Plain, Tinned, Weather Proof and Fire Proof Underwriters', Office and Annunciator Copper Wires. The base prices established February 3 have continued throughout the remainder of the year, and are nominally current to-day. Manufacturers, however, in making quotations prefer to do so from specifications in this line of goods.

SHEET BRASS, BRASS WIRE, &C.—An increase in price in Sheet Brass and Brass Wire was made in the latter part of January, the discount of 35 per cent. from list on both being advanced to 30 per cent., followed early in February by further advances to 20 per cent. on Sheet Brass, Brass Wire and Brass Rods, and at the same time Brazed Brass Tubes were put at 35 per cent. off. On April 19 further advances were made in a large line of Brass Goods of this general character, among which were the following: Roll and Sheet Brass, High Brass Rods, Wire in Coils (No. 20 or coarser), Brass Spooling Wire, Brass Segments and Printers' Galley Sheets to 15 per cent. discount. Brazed Brass Tubing, Brass Moldings, Door Rail, Brazed Taper Tubes and Angle and Channel Brass were put at 30 per cent. off, Leveled Sign Brass 10 per cent. and Platers' Metal, thinner than No. 38, 20 per cent. discount.

JACK CHAIN, BRASS AND IRON, SAFETY, &C.—Early in February Brass Jack Chain was advanced to 60 per cent. discount, and Iron Jack Chain to 70 and 10 off. Brass Safety and Plumbers' Safety Chain last February was advanced from 80 to 70 per cent.

SEAMLESS BRASS AND COPPER TUBES.—A year ago the price on Seamless Brass and Copper Tubes was on a basis of 16 cents for Iron Pipe sizes for Brass, with an advance of 3 cents on Copper Tubes of the same character. On January 25 the price became 19 cents, and on February 6 21 cents, which is still in force.

Wrought Butts, Strap and T Hinges, Etc.

This line is affected directly by the increased cost of Steel, so materially advanced during the year. The condition of things is reflected in the fact that on light Strap and T Hinges the base discount in January, 1899, was 75, 10 and 5 per cent., from which point it was raised in successive advances to discount 66 2-3 per cent. Heavy Strap Hinges in the same period advanced from the base discount of 80 and 10 per cent. to discount 70 per cent., the figure at which the year closed. Beyond these discounts it will be understood that an extra 20 or 25 per cent. is given. The advance on this line is thus slightly more than 50 per cent. In Screw Hook and Strap Hinges there has been an even greater advance, the base at the opening of the year being 1¾ cents, and at its close 3 cents.

Stove Hollow Ware.

The market for Cast Iron Stove Hollow Ware has been characterized by a firm tone through the greater part of the year, and prices are higher, but the advances have not been nearly as heavy as in some other lines. In a general way the market is represented by a discount of from 65 to 65 and 10 per cent. on Unground, and from 60 to 60 and 7½ per cent. on the Ground, Maslins being held at from 75 and 10 to 80 per cent. discount.

Wrenches.

Most Wrenches during the year have been advanced in price. On those of the Coes Wrench Company, a moderate advance was made in August, by which the printed base discount was made 33 1-3 per cent., instead of 40 per cent., as heretofore, which represents the change in prices during the year. Not all manufacturers have been so conservative in the matter of advances. Common Agricultural Wrenches are held at much higher prices than when the year opened, the discount at that time going as low as 80 and 10 and 10 per cent. A general price now is discount 70 and 10 per cent., with only moderate extras beyond. The tone of the market is firm.

Builders' Hardware.

The manufacturers of Door Locks, Knobs and Trimmings, Door Bolts, Door Butts, plain and ornamental (except the common cast and wrought Butts), Cupboard Catches, Sash Fasteners, &c., have during the past year been working together with a harmony which has not characterized their previous relations, and as a result there have been several advances in this line of goods. The first step in this direction in the year under review was taken in January, when a general advance of 10 per cent. was determined upon. In April another advance of 10 per cent. went into effect, and in July an advance of 20 per cent. The condition of the market was such that there was little disposition on the part of manufacturers to undersell the prices thus agreed upon, and the demand was of such a character as to keep the factories well occupied. In December a further advance of 11 per cent. was made and a system of moderate quantity discounts adopted with a view to giving the larger

trade a better protection. As the result of these successive advances the prices on this line of goods are, it will be seen, about 60 per cent. higher than at the opening of the year.

Picks and Mattocks.

This is a line which, on account of the low level of prices from which it started and the fact that the raw material represents a large proportion of the cost, has during the year shown a marked advance. In January last the discount of 80 and 2½ per cent. was obtainable by large buyers, but until August there were gradual advances by way of diminished discounts and higher list prices, until the market was represented by the quotation of discount 65 to 65 and 10 per cent., a price which is still current. The change in list above referred to was made in February, when an advance of 50 cents was made in the list price of Picks and $1 on Mattocks and Grub Hoes.

Axes.

The Axe market entered the year past with low and unsatisfactory prices, $3.75 being a representative quotation for first quality goods. This was gradually advanced so that a quotation of $5.75 to $6 is now representative. When the upward movement of prices developed several of the leading manufacturers found their order books encumbered with very large orders at extremely low prices, and they have accordingly not been in a position to realize as much advantage as would otherwise have been the case from improved conditions. The demand has been very active and a good deal of difficulty has been experienced by the manufacturers in making shipments as promptly as the trade wished. The stock in jobbers' hands purchased at low prices induced for some time an element of some irregularity in the market.

Screen Wire Cloth.

At the opening of the year Screen Wire Cloth was obtainable at 80 cents per 100 square feet, and the jobbers who purchased at anything like this figure were permitted to reap handsome profits, as under the influence of higher manufacturers' prices, on account of the advance in Wire and the development of a scarcity, they were enabled to dispose of the goods at much higher prices, ranging anywhere from $1 to $1.50. On orders for the season of 1900 $1.25 was a representative price, but this was practically withdrawn before the close of the year, and the market is now represented by $1.40 to $1.50. Some manufacturers are supposed to be holding aloof, anticipating still higher prices.

Miscellaneous Goods Made from Wire.

Wire Goods of a miscellaneous character have been influenced by the higher prices of Wire, the difficulty in obtaining the material even at marked advances and sympathetically firmer tone in nearly all manufactured goods. Early in the year manufacturers became conservative in making quotations, preferring to name prices only for immediate acceptance. These remarks apply to a large variety of goods, such as Sifters, Sieves, Riddles, Sand Screens, many kinds of Mouse and Rat Traps, Corn Poppers, Fly Traps, Wire Clothes Line, Wire Muzzles, Window Guards and Wire work in general. The conditions referred to have operated to curtail the volume of foreign shipments somewhat.

Wire Picture Cord has also appreciated in price, and has been characterized by a strong tone. There was a diversity in quotations for a time, owing to the large stocks held by jobbers, purchased at lower figures, and also in consequence of the various ways of putting it up, which may be described as regular goods, full measure, regular goods, short measure; special goods, full measure, and special goods, short measure, the lowest quotations naturally being for special goods, short measure. The market at the close of the year shows a marked improvement, and is regarded as in excellent condition.

Sandpaper

held steadily through the year until December 23 without any advance, when the appreciation in price of the crude materials used in its manufacture compelled an advance in the lists of Flint and Sand Paper sufficient to cover enhanced costs, no change being made in discounts, the market being represented now by a discount of from 50 and 10 to 60 per cent., with a greater discount for lower grades. There was no change whatever in Garnet or Ruby Papers, while Emery Goods are somewhat lower.

Belting,

both Leather and Rubber, held fairly steady throughout the year. On November 15 last manufacturers of Oak Tanned Leather Belting adopted a revised list, effective November 20, and subject to a discount of 50 and 10 per cent.

Rubber Belting experienced a rather heavy demand and good sales were made. The price of Crude Rubber steadily advanced during the year, together with other materials that enter into its manufacture. During the latter part of the year the price of Cotton Duck also advanced, thus materially increasing the cost of Belting. Belting ruled low for a considerable portion of the year, and although some slight advances have been made by manufacturers the advance in the price of Finished Belting has not kept pace with advances in crude materials entering into its composition.

Silver Plated Ware

is now in a good measure controlled by what is known as the International Silver Company, who are a consolidation of many of the leading makers controlling the Rogers brand of Table Ware and many of the popular brands of Silver Plated Ware in use in this country. While practically a feature of the past year the company combining 13 leading makers were incorporated November 21, 1898, and claim to produce 70 per cent. of the Silver Plated Ware of this country. Outside of this company, however, are still a number of well-known makers whose goods are favorably known.

Wire Rope.

The radical change in the price of Wire necessitated higher prices for Wire Rope. In addition to some changes in discount this led to the adoption of a new list on Wire Rope under date July 1.

Sad Irons.

The common Sad Iron market has been an active one during the past year, both in demand and in advancing prices, the advance amounting to more than 1 cent per pound. The present price is 3.50 cents per pound in barrel lots and 3.60 cents per pound in case lots. Manufacturers have been exceedingly busy during the past year. Some are not now able to make prompt deliveries, owing to the large number of orders on their books. An advance in price is not improbable in the near future.

MRS. POTT'S SAD IRONS.—There have been several advances in the price of Mrs. Pott's Sad Irons during the year. The present price is the one made in September. The market has been irregular at times. Manufacturers have been annoyed because the jobbing trade have been in a position to undersell them, and in some cases quoted small buyers lower prices than were obtainable by the largest houses on carload lots. Present prices are considered satisfactory to manufacturers, as has been the volume of business, which has largely exceeded that of former years.

Twist Drills.

Generally speaking, the market for Twist Drills during 1899 has been quite satisfactory. In no year, perhaps, in the last ten have the conditions been maintained so uniformly. The demand has been unprecedented from all parts of the country, with a very marked increase in business from abroad. A remarkable increase is noted in demand for large sizes of Twist

Drills, 1¼ up to 3 inches in diameter. Prices during the year remained stable, in accordance with the more harmonious relations of the manufacturers dating from the fall of 1898, at which time some of them were probably marketing the goods at an actual loss. The general indications seem to be that the Drills purchased during the past year have been consumed or used and that no large stocks are held either by manufacturers or jobbers. The conditions which characterize the market at the present time are looked for to continue for the first six months of the coming year, although the prices of Twist Drills are regarded, by some of the manufacturers at least, as lower than justified by the advances in raw material and the higher prices paid for all supplies, including fuel and labor.

Tackle Blocks.

The past year opened wtih a fair number of orders in hand and a satisfactory trade in sight, a condition which has continued through the entire season, with the result that the manufacturers have rarely closed a year with books so well supplied with orders. While no boom is looked for in this line in the near future, the outlook is regarded as encouraging, especially if the manufacturers can establish and put in force selling prices that will more adequately cover the increased cost of materials and labor. During the year the manufacturers have been slow in anticipating advances, and as a result their margin of profit for the last half of the year will not make as good a showing as the first half. During the past few weeks, however, the manufacturers have realized the importance of revising and advancing prices and are working together more harmoniously than ever before, with a fair prospect that during the coming season better values will be attained, although margins of profit on certain lines will probably remain lower than they ought to be on account of the very large advances in metals, which constitute so large a part of the cost of a Block.

Carriage Forgings.

During January and February Carriage Forgings were in excellent demand, but prices were the lowest ever known. With the advance in raw material the finished product was advanced about 10 per cent. in March, and similar advances followed each succeeding month until September. These advances had no effect on the volume of trade, which continued very good during the whole season. Nearly all the contracts for the coming season have, we are advised, been renewed at the prices ruling in September and October, which are about the same as those now in force, and the prospects all point to a satisfactory business during 1900.

Hardware Association of the City of New York.

THE leading jobbers of Hardware in this city, to whose organization as "the Hardware Association of the City of New York" we have already referred, are desirous of having as members of their organization all who are eligible to join, the admission being $10 and annual dues $10.

The officers are Alfred D. Clinch of Underhill, Clinch & Co., president; Edward C. Van Glahn, White, Van Glahn & Co., treasurer, and Benjamin A. Hawley, Russell & Erwin Mfg. Company, secretary. The Executive Committee consists of Thomas J. Atkins, Sargent & Co.; Robert Sickels, Sickels-Nutting Company, together with the officers named above.

The following address, which explains itself, has been issued in the name of the concerns who are actively identified with the association:

To the Members of the Hardware and Allied Trades:

There has recently been formed the Hardware Association of the City of New York by the Hardware jobbers engaged in business in this city, the objects of which are the advancement of all commercial and financial interests of the Hardware and allied trades. Provision has been made in its constitution for membership of Hardware jobbers, Hardware manufacturers, Hardware commission merchants, and wholesale jobbers of allied goods. The many encouraging and enthusiastic remarks made by members of our trade, and the hearty commendation by the trade journals, have justified the formation of the association, for it is realized that at no former time in the history of trades of all kinds has there been felt so strong a demand for organization for self interests as there is at present. Confidence in the integrity of merchants has been stimulated by personal contact, and the welfare of one has been found to be the welfare of all. For these reasons we appeal to you for early membership, believing the movement soon will become a potent force for the betterment of business in our credit, buying and selling departments, and that the association will become a recognized power among commercial bodies.

We inclose a copy of our constitution and a membership blank. Respectfully,

SARGENT & CO.,
RUSSELL & ERWIN MFG. COMPANY,
SICKELS-NUTTING COMPANY,
SMITH, LYON & FIELD,
C. A. BAYNON COMPANY,
ROBERT J. MASBACH,
WHITE, VAN GLAHN & CO.,
UNDERHILL, CLINCH & CO.,
Constituent Members.

NEW YORK, December 15, 1899.

This organization will doubtless meet, as it deserves, the approval of the trade, who can thus unite effectively for the advancement of their mutual interests.

Chas. Millar & Son Company.

CHAS. MILLAR & SON, Utica, one of the oldest and most successful firms in Central New York, conducting a wholesale business in Hardware, Tinners' and Plumbers' Supplies, have just been incorporated as Charles Millar & Son Company, under the laws of the State of New York, with $200,000 capital. The business was originally started by Charles Millar in 1861. In 1866 the firm was organized by the admission of Henry W. Millar, and the firm name has not been changed since. In 1890 Mr. Millar died, and on August 4, 1899, John L. Murray, who was admitted as a partner in 1883, died. The business has since been carried on by Henry W. Millar, the sole surviving member of the firm. The latter, in order to relieve himself from some of the close application and attention required in so large a business, and also to secure perhaps a greater degree of permanency, decided to incorporate the business, and in doing so secured the co-operation of the following gentlemen, who with him act as directors: Charles S. Symonds, Nicholas E. Kernan and John A. Kernan of Utica, N. Y., and Edward G. Wagner of Whitesboro, N. Y. The officers of the company elected by the directors are: Henry W. Millar, president and treasurer; Charles S. Symonds, vice-president; John A. Kernan, secretary; Levi H. Birdseye, manager; Alfred H. Dobson, assistant treasurer. The business in all its branches will be continued by the new company.

Dame, Stoddard & Co.

AT the expiration of the copartnership of Dame, Stoddard & Kendall, Boston, December 31, 1899, Mr. Kendall will retire, and the business, beginning January 1, 1900, will be continued under the style of Dame, Stoddard & Co. Messrs. Dame and Stoddard have been for the past 40 years connected with this house as clerks and principals, during which time the house have become widely known to the trade as importers and dealers, and have established themselves as leaders in the distribution of their lines of Cutlery, Skates and Fishing Tackle.

Since the establishment of the business in 1800 the names of the firm, indicating the successive changes of the 100 years of its history, are as follows:

Samuel Bradley, 1800.
Martin L. Bradley, 1845.
Martin L. Bradley & Co., 1856.
Bradford & Anthony, 1867.
Dame, Stoddard & Kendall, 1883.
Dame, Stoddard & Co., 1900.

THE DE KALB FENCE COMPANY, De Kalb, Ill., manufacturers of Woven Wire Fencing, have made selling arrangements with Rotherham, Wood & Co., Melbourne, Australia, to cover trade in Australia, Tasmania and New Zealand.

Wilcox Mfg. Company.

A NUMBER of changes have lately occurred in the *personnel* of the Wilcox Mfg. Company, Aurora, Ill. D. W. and L. R. Simpson have purchased the stock of the former president, J. H. Pease, and H. O. Spencer has been elected to the office of vice-president. Mr. Spencer has been in the employ of the company as salesman for over 18 years, and is said to be the oldest traveling salesman in the Hanger line. His many friends and customers will be glad to hear of his promotion. The company state that their policy is and has been to give the best they have to their tried and true employees. Every foreman and superintendent in their employ began as an apprentice, and the office is moved nearer to the work bench year by year. The present officers and stockholders of this company are D. W. Simpson, president and treasurer; H. O. Spencer, vice-president, and L. R. Simpson, secretary. That the employees of the company hold their president and manager, D. W. Simpson, in very high regard is evident from their presentation to him a few days since of a beautiful silver match safe especially adapted for machinists' use for cutting metals holder, a pocket cigar case and a costly traveler's morocco toilet case, containing a mirror and a pair of military brushes, all articles beautifully lettered.

Trade Items.

THE PIKE MFG. COMPANY, Pike Station, N. H., and 151 Chambers street, New York, have arranged with the Norton Emery Wheel Company of Worcester, Mass., for the exclusive sale of the India Oil Stone line. By reason of its remarkable cutting qualities and extreme hardness the India Oil Stone is referred to as especially adapted for machinists' use for cutting metals that a file would slip on. They are made in several grades of fineness, and particular attention will be given to special shapes for special and experimental work. No change will be made in the prices of these Stones, and the advantage to the dealer of being able to cover his requirements for all kinds and grades of Sharpening Stones in a single order, which this arrangement permits, will be obvious. A complete stock of regular shapes and sizes will be carried at Pike Station as well as at their store, 151 Chambers street, New York.

THE New York headquarters of the old Cutlery firm of W. & S. Butcher, Sheffield, England, are now at 298 Broadway, their representative as for years past being John W. Hughes, who occupies a portion of the premises leased by Max Klaas.

ON Saturday evening, December 23, 1899, the McKinney Mfg. Company, Allegheny, Pa., manufacturers of Steel Hinges and Butts, presented $100 in gold to a valued employee, Miss Elizabeth Hart, who has been in their service for nearly 20 years. The 500 employees of the firm were at the presentation and appropriate addresses were made. The firm are highly regarded by their employees for considerate treatment, the firm furnishing hot coffee, milk and sugar for the midday lunches free of all charge, while in cases of sickness or accidents to any employee provision is made by the firm for their care. The McKinney Mfg. Company's large plant has been running to full capacity for some months and their trade the past year was much the largest of any in their history.

THE attention of the trade is directed to the announcement of the Griffin Mfg. Company, Allegheny, Pa., which will be found in the advertising pages of this issue. This concern are manufacturers of the Griffin Improved Pressed Steel Shelf Bracket, which is made in different finishes and for which some strong points of superiority are claimed.

BROWN & WALES, 69-83 Purchase street, Boston, Mass., have taken the New England agency for the following manufacturing concerns: Pittsburgh Steel Hoop Company, Old Meadow Rolling Mill, Phœnix Steel Wire Company, J. Barton Smith Company, New Haven Copper Company, Scranton Bolt & Nut Company, the Kirkpatrick & Co., Limited, New York Steel & Copper Plate Company, Grant Ball Company and Bridgeport Gun Implement Company. Brown & Wales have recently established a representative in New York City in the person of A. T. Shoemaker, 32 Broadway.

IN the case of the Billings & Spencer Company and Charles E. Billings, Hartford, Conn., *vs.* the Van Wagoner & Williams Hardware Company, Cleveland, Ohio, in which the validity of the former's commutator bar patent was at issue, a decision favorable to the Van Wagoner & Williams Hardware Company has been rendered by Judge Taft. The case was tried in the United States Circuit Court for the northern district of Ohio, eastern division.

JOHN H. GRAHAM & Co., 113 Chambers street, New York, have been appointed selling agents for the New Process Twist Drill Company. Drills made by this company are referred to as all ground to micrometer caliper gauge and accurate, durable and highly finished, goods not found as represented being replaced without charge.

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A Mexican Hardware Store.

HEYMANN SUCESORES.

AS a representative house, a description is given herewith of the wholesale and retail establishment of Heymann Sucesores, located at Mazatlan, Sinaloa, Mexico. The business is the oldest as well as the largest one at this port, having been established about 1845 by Theodor Heymann and Cæsar Bertheau, carrying a line of Hardware, Jewelry, &c. Under the firm name of Heymann, Bertheau & Co., C. A. Volquardsen entered as a partner in 1866, having been an employee since 1857. A few years later Mr. Bertheau retired, and the firm became T. Heymann & Co., and thus continued until 1881, when C. A. Volquardsen and T. Heymann, Jr., formed a partnership under the firm name of Heymann Sucesores. In 1887 C. A. Volquardsen assumed the entire business, retaining, however, the firm name. He was about retiring in 1891 when he died suddenly, and his son, Carlos L. Volquardsen, who had been an employee since 1887, took charge of the business, of which he has since been manager and head. His portrait is given herewith. Two brothers-in-law and his mother are partners with him in the business. Mr. Volquardsen was born in Mazatlan, educated in Germany, returned to his native city when 20 years of age, and entered his father's store as a clerk. A reproduction of the trade-mark of the house is given in Fig. 7.

From the ground plan of the establishment, shown in Fig. 1, an idea of its size and arrangement may be had. The larger portion of the present building was erected in 1862, and as occasion required the interior has been rearranged and additions made, adapting it to the requirements of a growing business and diversified stock. At the time the store was built goods were received but once a year by sailing vessel and were sold without the aid of samples. At that time the requirements of purchasing merchants were for staple goods only, but during the past 20 years the firm has been obliged to import more fancy and finer articles, necessitating the arrangement of some rooms for samples and salesrooms, as indicated in Fig. 1. Stock is carried in warehouses, and so placed as to best accommodate the varied goods economically.

The principal business of the firm is the sale of Hardware, Tools and Machinery, but in addition their stock includes many other lines. The amount of stock varies, according to the time of year, from $300,000 to $400,000, and includes American and English Hardware, American Tools, Furniture, Lamps, Photographic Articles, Glassware, Crockery and Japanese and Chinese goods. The firm are agents for the Pope Mfg. Company, Blickensderffer Mfg. Company, the Loewenbraeu Muenchen, the Janus Steel Works, and other manufacturers in America and Germany. They are also agents for several marine and fire insurance companies, as well as bankers for the Equitable Life Insurance Company.

Carlos L. Volquardsen.

Fig. 2.—View from Front of Store Toward Office

An illustrated catalogue which they issue supplementary to their general catalogue of 1893, contains a total of 798 illustrations, numbered from 1 up for better identification. The goods shown comprehend Firearms, Optical Goods, Enameled Ware, and Kitchen Utensils, Scales, Brushes, General and Builders' Hardware,

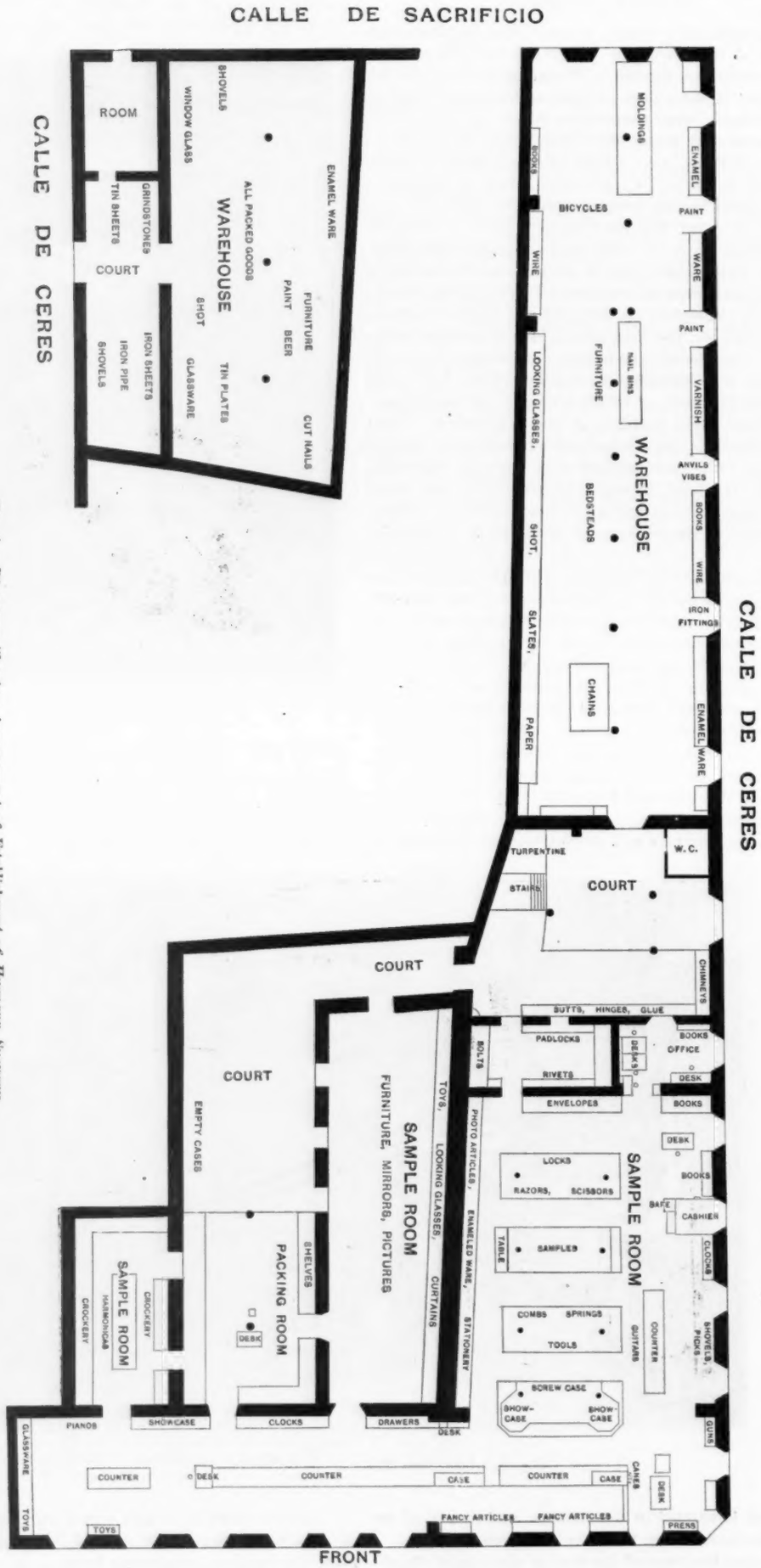


Fig. 1.—Diagrams Showing Arrangement of Establishment of Heymann Successors.

Lamps, Dairy Goods, Musical Instruments, Saddlery Hardware, Bird Cages, Cutlery, Clocks, &c. A unique grouping is occasioned by the system of assembling all the goods under A in the first division, followed by groupings under the remaining letters of the alphabet.

by steamer via Panama, paying freight by the latter route of 65 to 85 cents per cubic foot or 1 to 1½ cents per pound. The firm export to New York and San Francisco Sealskins, Seal Oil, Alligator Hides, Salted Hides, Tortoise Shells and Shrimp.

Fig. 3.—View to Left Along Front of Store.

The firm's imports from the United States have increased considerably during the past few years, and include the following goods: All Shelf Hardware, Pianos, Organs and Musical Instruments, Fancy Goods, Jewelry, Furniture, Pictures, Refrigerators, Stoves, Rifles, Cartridges, Paints and Varnishes, Toys, Nails, Iron Pipe and Fittings, Photographic Articles, Axes, Shovels, Bicycles, Tools, Machinery, Lamps, Watches, Clocks, Moldings, Wire, &c. These goods are imported through commission houses in New York, Chicago and San Francisco.

American goods are sent by rail via San Francisco or

Large yearly shipments of German and English staples come by sailing vessel, which leaves Hamburg about the middle of May and arrives at Mazatlan in October. The freight rate by sailing vessel from Germany is from 12 to 20 shillings per ton. The firm have recently

Fig 4.—View to Right Along Front of Store.

commenced buying many articles in China and Japan, such as Toys, Leather Goods, Rattan Ware, Fans, Mattings, Paper, Envelopes, Crockery, &c., all of which are much cheaper than in the old country or the United States.

The firm have been subscribers of *The Iron Age* for a

number of years, and are progressive in their business methods, as will be noticed by the arrangement of the interior of their establishment, as indicated in Figs. 2, 3 and 4. The store is provided with modern fixtures, trolley ladders, electric lights, &c., with shelves having sample boxes or drawers for Shelf Hardware and wall and show cases for the finer goods; in general appearance resembling an up to date Hardware establishment in the United States. Fig. 2 gives a view from the front of the store looking toward the office. Fig. 3 shows the arrangement of cases and shelving along the front of the store looking toward the left, while Fig. 4 is of the same counter and showcase but looking to the right, and includes the manager's desk at the corner of the building.

Fig. 5.—Interior of Packing Room.

The large portion of the store, that facing Calle Principal and Calle de Ceres, was erected in 1862, and is two stories in hight. Additional rooms have since been built as necessity required. Portions of the building indicated as "courts" in Fig. 1 are without roofs. Fig. 5 shows the interior of the packing department.

Fourteen persons are employed in the sales department and six in the office, most of whom are Mexicans, but a few are Germans. They are required to be familiar with the German, English and Spanish languages. Fig. 6 gives a view of the firm's corner.

The busiest time of the year is from November to January, when the force is almost inadequate to properly attend to the jobbing trade in addition to their retail business. At such times it is not infrequently necessary to work from 7 o'clock in the morning until 11 or 12 o'clock at night. During the remainder of the year the regular business hours are from 7 to 12 a.m., and from 2 to 6.30 p.m. The store is absolutely closed from 12 to 2 o'clock, a practice which would be quite an innovation for this country.

Nearly half the business is done on credit, 30 to 60 days' time being given to well-known city customers. Goods sold at wholesale are billed at net prices on six to eight months' time, with an additional charge of interest at the rate of 1 per cent. per month from date of sale for the accommodation. Cash business has been on the increase during the past few years, but no cash discount is ever allowed on payments.

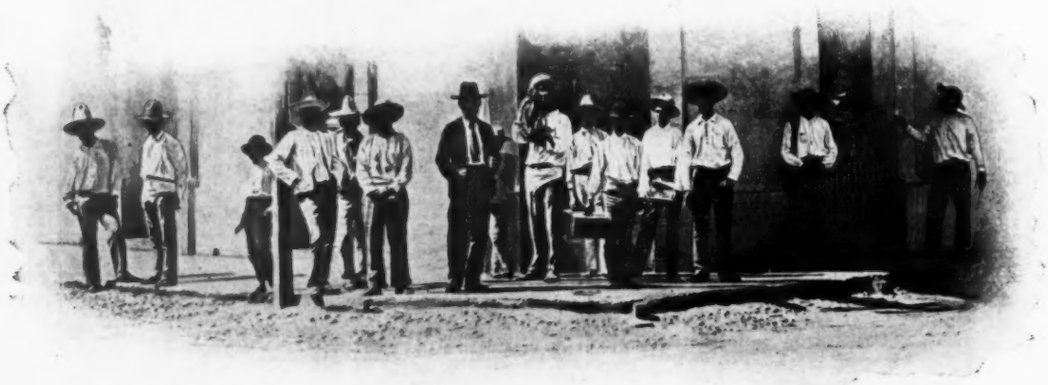


Fig. 6.—In Front of the Store.

The duties are reasonable, but taxes are very high, and are imposed in a manner that would be obnoxious to the American merchant. On all sales, retail or wholesale, cash or credit, the State Government demands $2.60 for every $100 worth of goods sold. Stamps to the value of 3 cents are required on each bill for each $5. All credit sales have to be settled by promissory notes, upon which stamps have to be placed. No invoice or other document without stamps is valid. For imported goods five consular invoices have to be made at the shipping port and five more of like kind at the receiving port.

When sending goods to customers in the interior the invoices have to be presented at the custom house and four pass bills are made out with weight and rate of duties of each article. All these papers require stamps affixed. For each page of the ledger, cash book and journal 5 cents tax is paid, and for each page of the bill copying book 1 cent is paid. An exact statement of the month's sales has to be sent to the State Rent office each month, as a result of which requirement every one can become informed of the amount of business any merchant is doing. There is no tax on incomes, but city taxes are very high.

Mexican currency is on a silver basis, the equivalent of their dollar, which is the unit of value, being at present $0.481, or less than half of its value in United States

Fig. 7.—Trade-Mark.

currency, fluctuating continually as the price of silver bullion varies.

Sinaloa is the principal seaport on the western coast of Mexico and is the center of large mining interests. A railroad only is required to make this industry more profitable. Sinaloa is full of rich gold and silver mines, a large proportion of which cannot be, or are not, worked because of the scarcity of money. Most of the largest mines are in the hands of Americans.

Among the Hardware Trade.

B. S. Webb of Los Angeles, Cal., has purchased the Hardware business of S. R. Headley, Covina, Cal.

Southern Hardware Company, Charlotte, N. C., have incorporated, with T. W. Dixon as president and A. C. Hutchison secretary and treasurer. Their stock comprises Shelf and Heavy Hardware, Tinware, Agricultural Implements and Sporting Goods. They will carry on a retail business and will also solicit wholesale mail orders. Their storeroom has been completely remodeled and shelved, and a new plate glass front has been installed, bringing the establishment right up to date.

W. E. Hart & Co. have succeeded Rivers & Hart in the Hardware and Furniture business in Tracy, Iowa.

Laber & Worby, Creston, Wash., have taken possession of their new store, which is 24 x 82 feet in dimensions.

Wood & Turner, Modesto, Cal., have dissolved partnership by mutual consent, the members of the firm dividing equally their stock of merchandise and all other property. In the division Mr. Wood retains the present store building and Mr. Turner gets the building formerly occupied by B. Weil & Son. Mr. Wood has associated with himself his son, D. C. Wood, and will continue business under the style of W. B. Wood & Son in the old quarters. The Turner Hardware Company have been organized by Mr. Turner's sons and will do business in the Weil Building as above. The firm of Wood & Turner began business about 25 years ago.

The Hardware store belonging to the estate of C. W. Crampton, Osborne, Kan., has been disposed of to W. H. Boughner.

Samuel A. Snook has purchased the business of W. A. Dibert, Johnstown, Pa., and will continue at the old stand, one of the oldest and best known in that city.

Montana Trading Company, Big Timber, Mont., have absorbed the Hardware business of Busha & Bailey, the lumber interests of Clark Bros., the property of the Pioneer Milling Company and the electric lighting plant of Clark Bros. & Busha, which they will continue. A complete stock of everything contained in a first-class general store, together with groceries and dry goods, will be carried in the Busha & Bailey Building in addition to the Hardware stock. The company are a corporation organized under the laws of the State.

The old and well-known firm of A. B. Clarke & Son, Richmond, Va., have recently been incorporated under the laws of the State of Virginia, with a capital stock of $50,000. The officers of the corporation are G. Harvey Clarke, president; Carroll H. Jones, vice-president; Stanhope Libby, secretary and treasurer. Mr. Clarke has been connected with the old firm for the past 25 years as the active partner.

O. F. Millard has disposed of his Hardware and Stove business at Alexandria, La., to E. M. Murdock, who will continue at the old stand. Mr. Millard is expecting soon to enter the same business at another point.

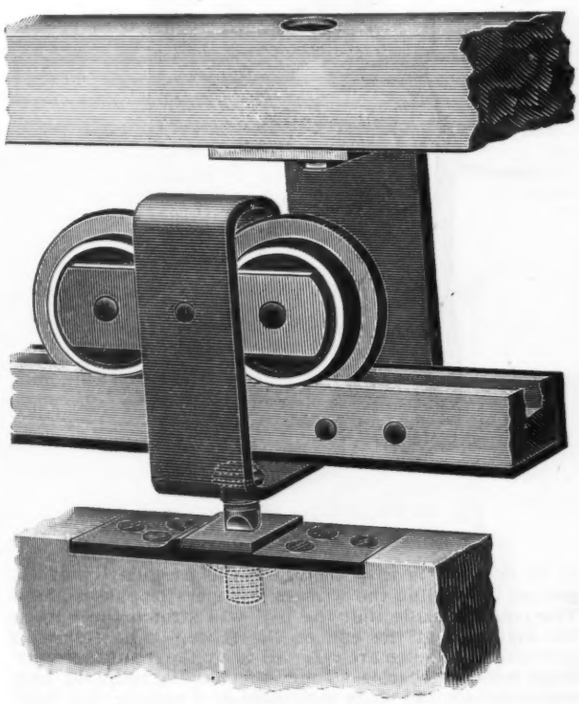
On January 1 Bird, Deem & Wooden, Greensburg, Ind., were succeeded by Bird, Meek & Wooden.

R. L. Spilker of Ellensburg, Wash., has entered into a partnership with L. E. Salladay and B. R. Spilker under the name of Kamiah Trading Company, Kamiah, Idaho. The firm's line comprises General Hardware, Agricultural Implements and hay and grain.

Baker & McDowell Hardware Company, Natchez, Miss., have lately been incorporated with a capital of over $100,000. The company comprise H. L. Baker, S. McDowell, A. E. James, W. D. Mounger and W. R. Patterson. They will conduct two establishments, wholesale and retail. Their wholesale store is located on Broadway, at a point where excellent facilities for the handling of goods are secured. Their building is a new three-story brick, built expressly for the Hardware business The structure is 85 x 115 feet. Their retail department is located on Franklin street in the store formerly occupied by Baker & James.

The Wilcox Swivel Ball Bearing Door Hanger.

A demand has sprung up within the past few years for a door hanger suitable for very large doors for auditoriums, churches, class-rooms, &c. This demand has not been fully met by the hangers available, because they did not possess some of the features essential. The



The Wilcox Swivel Ball Bearing Door Hanger.

Wilcox Mfg. Company, Aurora, Ill., have brought out a swivel ball bearing hanger, herewith illustrated, which they have designed specially for this purpose, and which has proved to be very satisfactory in its operation. The hanger is very easily applied. The track upon which it runs is one of its strongest features, being made with a wooden shoe so that the hanger runs absolutely without noise. The track can be readily taken down, or adjusted without taking down, and besides can be replaced should anything occur making this necessary. The parts of the hanger are made of steel and malleable iron. The finest ball bearings are used in the swivel and the wheels. The hanger is furnished in two sizes to fit doors of different thicknesses.

I. X. L. Combination Wire Stretcher, Splicer and Staple Puller.

The combined tool illustrated herewith is offered by O. P. Schriver & Co., Cincinnati, Ohio. The staple puller, as shown in Fig. 1, is at the end of the stretcher,

Fig. 1.—I. X. L. Combination Wire Stretcher, Splicer and Staple Puller.

while the wire splicer is a separate tool. The stretcher consists of a wooden handle 3 feet long, to which is attached a malleable iron clamp, constructed so that when the wire is clamped in it the wire will not slip. The grip in the clamp is made of the best tempered tool steel. It is explained that with the stretcher wire can not only be put on tighter in stapling from post to post, but that

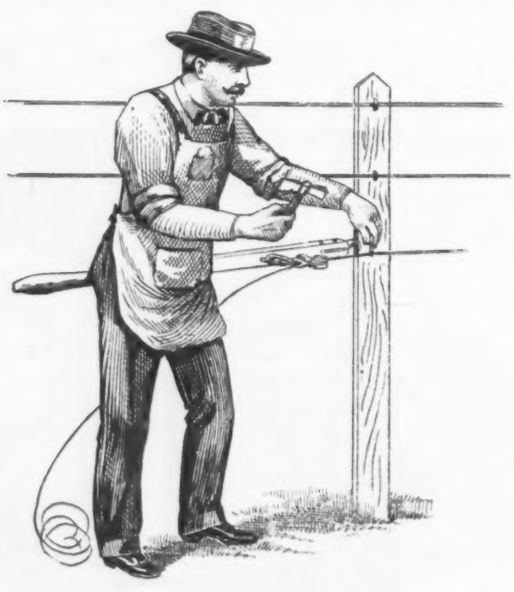


Fig. 2.—The I. X. L. Wire Stretcher in Use.

in so doing it is easy to follow the irregularity of the ground in stapling the wire as the operator passes along. The point is made that the tool will stretch the wire to the last post at the end of the fence. The following points of excellence are referred to by the manufacturers: That the stretcher is strong, the handle being of hard wood and all iron parts malleable or wrought; that there are but few parts, simple in construction, and not apt to get out of order; that the stretcher is painted with a special rust preventive maroon paint to render it durable and to give it a nice finish. Fig. 2 shows the special features of the stretcher, which is the ease with which one person can stretch and staple the wire to a post without assistance.

Miscellaneous Notes.

Shepard Wood Workers' Vises.

Prentiss Vise Company, 44 Barclay street, New York, have made some changes in and additions to their line of Shepard coach makers' solid jaw parallel vises, as illustrated in these columns some time ago. There are now two sizes, with stationary bottom, as follows: No. 168, 3½-inch jaws, opens 7 inches, weight 33 pounds; No. 68, 4½-inch jaws, opens 9 inches, weight 42 pounds. With swivel bottom the same sizes are made, Nos. 169 and 69, weighing respectively 38 and 46 pounds.

Duplex Sterling Washing Machine.

The duplex Sterling washing machine, manufactured by the Eureka Company, Rock Falls, Ill., which was recently illustrated in these columns, has a special feature not mentioned at that time. The machine is constructed to serve two purposes, one as a washing machine and the other as a bathtub. The top can be taken off readily and the inside taken out and the body is then ready for use as a bathtub. In shipping the machine it is not taken entirely apart. Only the fly wheel and the upper part of the machine are taken off so as to make a square package. It is thus shipped together compactly.

Ideal Broiler and Toaster.

The Ideal Gas Stove Utensil Company, 73 Murray street, New York, are offering a broiler and toaster, as herewith shown. In Fig. 1 is illustrated the broiler, while Fig. 2 shows the toaster, both of which are designed for use in connection with gas, oil and vapor stoves. The broiler is made of steel wire, with a perforated sheet steel bottom, which is set directly over the

Fig. 1.—The Perfection Broiler.

flame, to give perfect diffusion to the heat and to act directly on a corrugated steel sheet upon which the meat is placed. The broiler may be adjusted in hight according to the intensity of the heat to prevent the meat from direct contact with the flame, gas or smoke. At the end of the broiler a drip pan is attached to catch and retain the juices of the meat. The point is made that it is not necessary to hold the broiler when in use, that it will broil perfectly, leaving no taste or odor from the gas, oil or vapor used, and that it is simple in construction, durable and easy to use. If desired for toasting the corrugated steel sheet may be turned over to one side, like the cover of a book, exposing parallel wires upon which the bread may be placed.

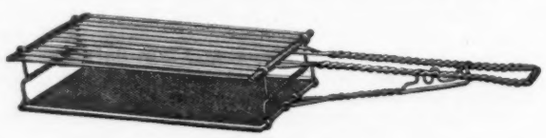


Fig. 2.—The Perfection Toaster.

The toaster, Fig. 2, is a modification of the broiler. It has a fine screen wire bottom instead of a perforated steel bottom to diffuse the heat, and parallel wires at the top upon which to place the bread.

Ball Bearing Wheels.

The McCabe Mfg. Company, 532-542 West Twenty-second street, New York, are putting on the market ball bearing wheels, shown in the accompanying cuts. The wheel is shown in Fig. 1, and in Fig. 2 the ball bearing,

Fig. 1.—Ball Bearing Wheel.

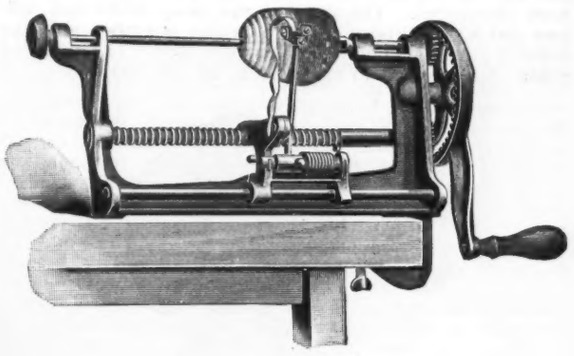
with a portion of the cups cut away to more clearly show the position of the balls. The cups are of turned steel hardened and ground. The cones are held together by means of a brass tube forming a hollow rivet. The

Fig. 2.—Ball Bearings in Detail.

wheels are designed for use in meat markets, abattoirs, &c., also in theaters for the shifting of scenery, &c. The company also manufacture a line of ball bearing hangers for use on parlor, fire, elevator, mill and car doors.

Victor Vegetable Parer.

The Goodell Company, 10 Warren street, New York, and Antrim, N. H., are manufacturing the Victor vegetable parer illustrated herewith. It is designed for paring potatoes, turnips, carrots, parsnips, cucumbers, &c., as well as apples, quinces, &c. The claim the manufacturers make for this utensil is that it will quickly and thoroughly pare the vegetables named without regard to uneven surfaces and diverse shapes. The erratic shapes and sizes of vegetables have always operated to prevent successful paring, a condition this parer has been designed to overcome. The lower measurement, as the parer is clamped to table or shelf, is 13 inches in length, the driving wheel being 5½ inches in diameter. The vegetable or fruit is impaled on a three-prong fork and steadied by the long pointed rod at the left, a necessary condition when the vegetables are long. The coiled spring working against the knife arm is strong enough to force the horseshoe-shaped knife into almost any depression or irregularity, while the outwardly curved blade is guarded so as to remove only a thin paring. The traveling knife frame can be started on the spiral at any



Victor Vegetable Parer.

point according to the length of the vegetable, and at the end is automatically thrown off from the pared article.

Blake Combination Pipe Vises.

Prentiss Vise Company, 44 Barclay street, New York, have just added to their line of vises the Blake pipe vise here illustrated. Fig. 1 shows the heavier pattern, made

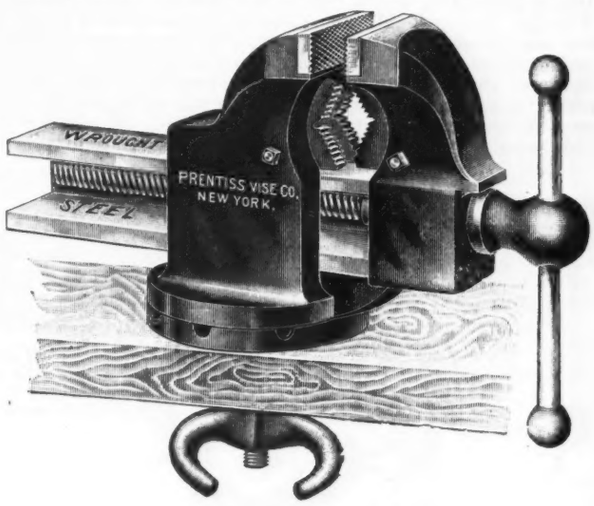


Fig 1. Blake Combination Pipe Vise.

with a wrought steel channel arm to stand hard usage. This vise is extra strong and combines the ordinary features of such a tool with reversible jaws for holding pipe. The swivel base is guaranteed not to slip. No. 183 has 6-

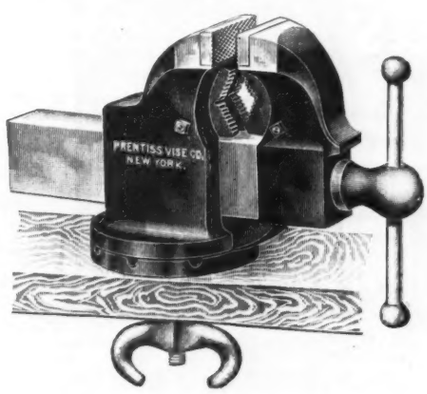


Fig. 2.- Similar Vise for Smaller Pipe.

inch jaws, holds ⅛ to 6 inch pipe, and weighs 155 pounds. No. 185 has 7-inch jaws, holds ⅛ to 8 inch pipe, and weighs 240 pounds. Fig. 2 is a similar vise with extra strong arm, No. 181 having 3½-inch jaws with a pipe capacity of ⅛ to 2½ inches, weight 53 pounds, and No. 182 4¼-inch jaws, ⅛ to 3 inch pipe, and weight 75 pounds. The manufacturers refer to the exceptional strength of these vises.

Eclipse Acetylene Gas Lamp.

Eclipse Bicycle Company, Elmira, N. Y., have recently put on the market the Eclipse acetylene gas lamp, as here illustrated. The base of the lamp is divided into two parts, the upper being a water chamber and the lower a carbide holder. The carbide holder is a nickeled brass cup screwed to the bottom of the lamp base. A

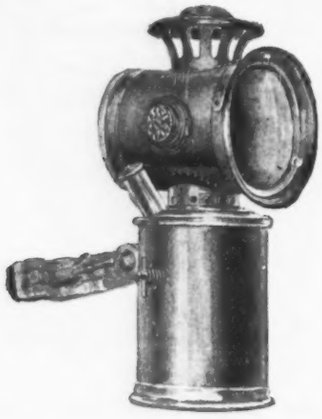


Fig. 1.—Eclipse Acetylene Gas Lamp.

long tube leading from the water chamber reaches down into a perforated metal tube, covered with cotton cloth. The gas tube through which the gas is conducted from the carbide chamber to the burner starts from the inside and extreme bottom of the lamp base to the water chamber and through the water to the burner. This construction causes the gas after leaving the carbide cup to pass down and circulate around the outside of the carbide chamber before entering the tube leading to the

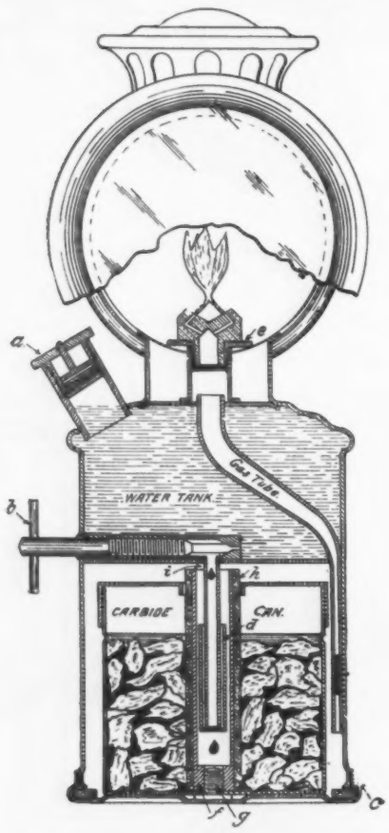


Fig. 2.—Sectional View of Eclipse Lamp.

burner, thus, it is said, thoroughly drying the gas before it enters the gas tube. The lava tip burner can be unscrewed with the fingers if it becomes necessary to clean it, and underneath will be found a felt plug which can also be readily cleaned. Fig. 1 shows the interior construction, *a* being the tube through which water is introduced, and *b* the key to the valve controlling the water supply. The lamps can be lighted from either side, as both jewels are hinged to swing upward. An aluminum reflector is attached to the back cap, which is held to the body of the lamp by three bayonet catches. The reflector is purposely set well back from the flame to prevent tarnishing. The lens in front can be removed by lifting a curved flat snap spring. The top of the lamp is also made of aluminum, the body of the lamp being nickeled brass. The lamp is 8 inches high and weighs 20 ounces.

Jewelers' Table Anvil.

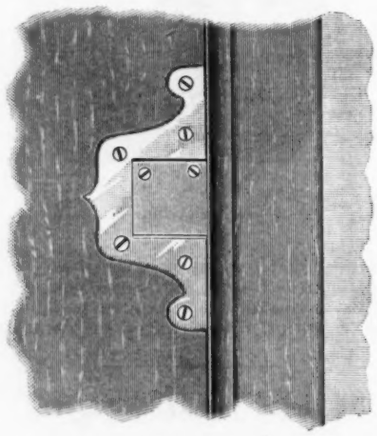
Prentiss Vise Company, 44 Barclay street, New York, have put on the market the jewelers' table anvil, as here illustrated. They are made in but one size, having a base 3 inches in diameter at the bottom, the extreme hight being 2 inches and weight 1¼ pounds. The anvils are made of the best quality of cast steel, are 3⅜ inches

Jewelers' Table Anvil.

long over all and finely polished. Two styles are made, No. 500, with painted base, and No. 502, all polished and full nickel. The bases are made low and weighted on the bottom so that they stand firmly on bench or table. Each anvil is packed in a double pasteboard box.

The Easy Double Acting Spring Hinge.

The accompanying cut represents a double acting spring hinge put on the market by the Easy Spring Hinge Company, Shelby, Ohio. The hinge is in two parts, one to be attached to the door and the other to the door jamb. The hinge can be readily detached and each part put on separately and then coupled together; the door being centered by the screws in the cover plate



The Easy Double Acting Spring Hinge.

after it is hung. Tension of the spring is adjusted by a screw in the end of the center plate, governing the swing of the door, and relieving the screws, it is explained, from all strain. The spring is designed to be fitted to any swing door, and is referred to as providing a simple and efficient construction which permits of the door being readily hung and taken down. It is explained that on an inside door there is no swinging back and forth, a feature which is emphasized especially when a little child is considered, as there is no danger of being struck by a backward swing, also that it makes a valuable hinge for use between dining room and kitchen, there being no danger of knocking dishes from a waiter's hands.

It is stated that in the use of the hinge the door does not have to be rounded off on either edge, thus enabling it to come within 1-16 inch of the door jamb.

Current Hardware Prices.

REVISED JANUARY 2, 1900.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Cut Prices.—*In the present condition of the market, while many advanced prices are announced by the manufacturers, lower prices are often made by the wholesale trade who have stocks on hand purchased at former quotations.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 6, 1899), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—
Domestic, ₱ doz. $3.00....33⅓&10%
North's....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—
Ives' Patent....25&5%
Taplin's Perfection....50%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils....₱ lb 7¼@7¾c
Hay-Budden, Wrought....8@9¼c
Horseshoe brand, Wrought....9¼@9¾c
Samson....₱ lb 7¼@8c
Trenton, Wrought....₱ lb 8¼@8¾c

Imported—
Armitage's Mouse Hole....8¾@9¼c
Peter Wright's....9¼@9¾c

Anvil, Vise and Drill—
Millers Falls Co., $18.00....20%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—
Common Double Spur.60&10&10@70%
Boring Machine Augers....60&10&10@70%
Car Bits, 12-in. twist60&10@60&10&10%
Jennings' Pattern:
Auger Bits....60@60&10%
Ford's Auger and Car Bits..40&10@40&10&10%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list....40@40&10%
No. 80. R. Jennings' List..50&10@60%
Russell Jennings'....25&10&2½%
L'Hommedieu Car Bits15&10@15&10&5%
Pugn's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....60%
Snell's Bell Hangers' Bits....50%
Snell's Car Bits, 12-in. twist....60%
Wright's Jennings Bits (R. Jennings' list)....50%

Bit Stock Drills—
Standard List....65&10@70%

Expansive Bits—
Clark's small, $18; large, $26....50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18....50&10%
Steer's No. 1, $26; No. 2, $18...40@40&5%
Swan's....60%

Gimlet Bits—
Common Double Cut..gro. $2.75@3.25
German Pattern....gro. $5.00@5.50
Double Cut, makers' lists....50&5@50&10%

Hollow Augers—
Ames....25&10%
Bonney's Adjustable, ₱ doz....$16.00
New Patent....25&10%
Universal....20%

Ship Augers and Bits—
Ford's....40&10@40&10&10%
Snell's....40%
L'Hommedieu's....15&10@15&10&10%
Watrous'....40@40&5%

Awl Hafts, See *Hafts, Awl.*

Awls—
Brad Awls:
Handled....gro. $2.75@3.10
Unhandled, Shouldered gro.63@66c
Unhandled, Patent....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. 51@54c
Unhandled, Shouldered.gro.55@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
First Quality, best brands.$6.00@6.25
First Quality, other brands$5.50@5.75
Jobbers' Special Brands:
Good Quality....$5.25@5.50
Best Quality....$6.00@6.50
Cheap, Handled Axes....$4.75@5.00
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—

	Iron.	Steel.	
Concord, loose collar	6¼c	6 c	5% cash 10 days.
Concord, solid collar	6¾c	6½c	
No. 1 Common	5 c	4¾c	
No. 1¼ Com. New Style	5½c	5¼c	
No. 2, Solid Collar	5¾c	5½c	
Nos. 7, 8, 11 to 14		50&10%	
Nos. 7, 8, 11 to 14, 100 sets		60%	
Nos. 15 to 18		50%	
Nos. 19 to 22		60&10%	

Boxes, Axle—
Common and Concord, not turned..lb. 5c
Common and Concord, turned..lb. 6c
Half Patent....lb. 9c

Balances—
Sash—
Caldwell new list....50%
Pullman's....62½%
Spring—
Spring Balances....50@50&5%
Chatillon's Light Spg. Balances...40&10%
Chatillon Straight Balances....40%
Chatillon Circular Balances....50%
Chatillon's Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—
Steel Crowbars, 10 to 40 lb., per lb...4@4¼c

Beams, Scale—
Scale Beams, List Jan. 12, '82....30@30&5%
Chattillon's No. 1....30%
Chattillon's No. 2....40%

Beaters—Egg—
Standard Co.:
No. 5 Steel Handle Dover..₱ gro. $6.50
No. 10 Cast Handle Dover..₱ gro. $8.00
No. 10 Steel Handle Dover.₱ gro $8 00
No. 15 Extra Heavy Steel Handle, ₱ gro. $15.00
Rival, ₱ gro....$10.00
Taplin Mfg. Co.:

	₱ gro.
No. 50 Small Family size	$6.50
No. 100 Regular Family size	8.00
No. 102 Regular Family size, tinned	$9.50
No. 150 Large Family size	$15.00
No. 152 Large Family size, tinned	$17.00

Lyon's, Standard size....₱ doz. $1.75
Wonder (S. S. & Co.)....₱ gro. $7.50

Bellows—
Blacksmith—
Standard List....70@70&5%

Inch..	*30*	*32*	*34*	*36*	*38*	*40*	Net Prices.
Each	*$4.25*	*4.50*	*5.25*	*5.75*	*6.50*	*7.75*	
Extra Length:							
Each	*$4.75*	*5.25*	*5.75*	*6.50*	*7.40*	*8.75*	

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*16*	Net Prices.
Doz...	*$6.75*	*7.25*	*8.50*	*9.50*	*12.00*	*14.50*	

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*	*12*	Net Prices.
Doz....	*$3.75*	*4.25*	*4.50*	*5.00*	*5.75*	*6.75*	

Bells—Cow—
Ordinary goods....75&10%
High grade....70@70&10%
Jersey....75@75&10%
Texas Star....50&10%

Door—
Gong, Yankee....55%
Home, R. & E. Mfg. Co.'s....50&10%
Lever and Pull, Sargent's....33⅓&10%

Hand—
Hand Bells, Polished....65@65&10%
White Metal....65@65&10%
Nickel Plated....50@50&10%
Swiss....60@60&10%

Miscellaneous—
Farm Bells....lb. 2@2½c
Steel Alloy Church and School....50&10@60%
Wilmot & Hobbs Mfg. Co, Gongs....70%

Belting
Rubber—
Common Standard....70&10@75%
Standard....60&10@70%
Extra....60@60&10%
High Grade....60@60&10%
Leather—
Extra Heavy, Short Lap....50&10@50&10&5%
Regular Short Lap....60@60&10%
Standard....60&10@60&10&5%
Light Standard....70%
Cotton—
Rossendale-Reddaway B. & H. Co.:
Sphinx Brand....60&10%
Durable Brand....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters....20%
Ill. Iron & Bolt Co....40@40&5%
Stoddard's Lightning Tire Upsetters....40@50%

Bicycle Goods—
Lane's Cycle Hanger....33⅓&5%
John S. Long's Son's 1899 list:
Chain....50%
Parts....50%
Spokes....50%
Tubes....60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—
Common Wooden....70&10@75&10%
Eddy's Steel....60&10%
Hartz Steel....50&10%
Ford's Star Brand, Self Lubricating..70%
Hollow Steel, Ford's Pat. Star Brand...50&10%
Lane's Patent Automatic Lock and Junior....30%
Stowell's Novelty, Mal. Iron....50%
See also *Machines, Hoisting.*

Boards, Stove—
1899 List:
Zinc....80%
Crystal and Embossed....40%

Bolts—
Carriage, Machine, &c.—
Common, list Jan. 30, '95..45&5@50&10%
Norway Iron, $3.00, list Oct. 7, '84..75@75&10%
Phila. Eagle, $3.00 list....75&10@75&10&5%
Bolt Ends, list Jan. 30, '95....50&5@50&10&5%
Machine, list Oct. 1, '99..5....50&5@50&10&5%
NOTE.—*Jobbers' prices on Bolts are now generally lower than manufacturers'.*

Door and Shutter—
Cast Iron Barrel, Round Brass Knob:

Inch....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.33*	*.36*	*.45*	*.57*	*.80*

Cast Iron Spring Foot:

Inch....	*6*	*8*	*10*
Per doz....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch....	*6*	*8*	*10*
Per doz....	*$0.85*	*1.20*	*1.50*

Cast Iron Shutter, Brass Knobs:

Inch....	*6*	*8*	*10*
Per doz....	*$0.60*	*.90*	*1.15*

Wrought Barrel Brass Knob:

Inch....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.44*	*.50*	*.61*	*.70*	*1.28*

Wrought Barrel....70&10@75&5%
Wrought " Bronzed.40&5@50&10%
Wrought Flush, B. K..50&10@60&10%
Wrought Shutter...40&10&10@60&5%
Wrought Square Neck....50@50&10%
Wrought Sunk....50@50&10%
Ives' Patent Door....62½&@62½&10%

Stove and Plow—
Plow....60&10@60%
Stove, See Trade Report.

Tire—
Common, See Trade Report.
American Screw Company:
Norway Phila., list Oct. 16, '84....70%
Eagle Phila., list Oct. 16, '84....75%
Bay State, list Feb. 28, '83....60%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84....70%
Eagle Phila., list Oct. 16, '84....55%
Eclipse, list Feb. 28, '83....60%
Port Chester Bolt & Nut Company
Empire, list Feb. 28, '83....60%
Keystone Phila., list Oct. '84....75%
Norway Phila., list Oct. '84....70%

Borers, Tap—
Borers Tap, Ring, with Handle:

Inch....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$3.50*	*4.50*	*5.00*	*6.50*
Inch....		*2¼*		*2½*
Per Doz....		*$7.50*		*10.25*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each....25@30%

Boring Machines—See *Machines, Boring.*

Boxes, Mitre—
Seavey's, per doz., $24.00....25%

Braces—
NOTE.—*Most Braces are sold at net prices.*
Common Ball, American...$1.10@1.20
Barber's....50&10&10@60&10%
Fray's Genuine Spofford's....50&10&5%
Fray's No. 70 to 120, 81 to 123, 207 to 414....50&10&5%
P., S. & W. Co., Peck's Patent....50&10@60%

Brackets—
Cast Iron, plain....60&10@70&10%
Wrought Steel....70&10@75%
Bradley's Wire Shelf:
Full cases....80%
Broken cases....75&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—
Wire Goods Co....70@70&10%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—
Hoosier....₱ gro. $22.00@$24.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—
Wrought list Sept., '96...35&5@35⅓&5%
Cast Brass, Tiebout's....50%

Cast Iron—
Fast Joint, Broad....50@....%
Fast Joint, Narrow....50@....%
Loose Joint....66⅔&5@70&10%
Loose Pin....66⅔&5@70&10%
Mayer's Hinges....66⅔&5@70&10%
Parliament Butts....66⅔&5@70&10%
NOTE.—*Jobbers often undersell manufacturers.*

Wrought Steel—
Loose Joint
Table and Back Flaps
Narrow and Broad
Inside Blind — 70&5%
Loose Pin
Loose Pin, Ball and Steeple Tip — 70&10%
Bronzed Wrt. Nar. and Inside Blind Butts....50&10@50&10&5%

Cages, Bird—
Hendryx, Brass:
3000, 5000, 1100 series....5%
1200 series....33⅓&5%
200, 300, 600 and 900 series....40&10%
Hendryx Bronze:
700, 800 series....40&10%
Hendryx Enameled....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Can Openers—See *Openers, Can*

Cans, Milk—

Buffalo Pattern:	5	8	10 gal.
	$3.60	$4.00	..33⅓%
Illinois Pattern.	$2 40	3.10	3.50 ..33⅓%
Iowa Pattern...	2.40	3.35	3.75 ..33⅓%
	20	30	40 qts.
New York Patt'rn	3.00	4.35	4.60 ..33⅓%
Baltimore Patt'rn	3.10	4.45	4.70 ..33⅓%

Cans, Oil—
Galvanized Blue Band, 1-gal., ₱ doz. $1.75@$2.00
S. S. & Co., Galvanized Family with faucet, 3-gal., ₱ gro. $54; 5-gal., $63; 10-gal., $120.00
Glass Oil....₱ doz. $1.50@$2.20

Caps—Percussion—
Eley's E. B....50c
G. D....per M 32@34c
F. L....per M 37@40c
G. E....per M 47@50c
Musket....per M 57@60c

Primers—
Berdan Primers, $1.00....5%
B. L. Caps (Sturtevant Shells) $1.00....5%
All other primers....$1.10@$1.15

Carpet Stretchers—
See *Stretchers, Carpet.*

Cartridges—
B. B Caps, Con., Ball Swgd. $1.90
B. B Caps, Round Ball... $1.12@1.18
Blank Cartridges:
32 C. F., $5.50.....10c&5%
38 C. F., $7.00.....10c&5%
22 cal. Rim, $1.50.....10c&5%
32 cal. Rim, $2.75.....10c&5%
Central Fire.....2%
Pistol and Rifle.....15c&5%
Primed Shells and Bullets.....15c&5%
Rim Fire Sporting.....50%
Rim Fire, Military.....15c&5%

Casters—
Red.....60c&10%
Plat.....60c&10%
Plate, part Brass....50c&10%
Philadelphia.....60c&10%
Extra 10% often given.
Martin's Patent (Phœnix).....50&10%
Payson's Anti-friction Furniture.70&10%
Payson's Anti-Friction Truck....70&10%
Standard Ball Bearing.....45%
Tucker's Patent, low list.....45%

Cattle Leaders—
See *Leaders, Cattle.*

Chain—
American Coil, Full Casks:

3-16	¼	5-16	⅜	7-16	½	9-16
8.75	6.85	5.85	5.00	4.85	4.75	4.65
⅝	¾	⅞	1 inch.			
4.75	4.50	4.40	4.40 cents per lb.			

Less than Cask lots add ¼@½c per lb.
German Coil, list July 24, '97.....60&10@60c&10c&10%
German Halter Chain, list July 24, '97.....60&10@60c&10c&10%
Trace, Wagon and Fancy Chains, list April, '98.....50c&10@50c&10c&5%
Jack Chain, list July 10, '98:
Iron.....50c&5@60%
Brass.....50c&5@60%
Gal. Pump Chain.....lb. 5½@5¾c
Breast, Hitching and Rein Chains.
Covert Sad. Works.....50%
Covert Mfg. Co.:
Breast.....35&2%
Halter.....35&2%
Heel.....35&2%
Rein.....35&2%
Stallion.....35&2%
Oneida Community:
Eureka Coil and Halter.....80@80&5%
Niagara Coil and Halters....60@60&5%
Niagara Cow Ties.....45&5@45&10&5%
Am. Coil and Halters....50&10&5@60%
Am Cow Ties.....35&5@40&5%
Wire Goods Co.:
Dog Chain.....60%
Universal Dbl-Jointed Chain.....45%

Chalk—(From Jobbers.)
Carpenters', Blue.....gro. 50@52c
Carpenters', Red.....gro. 40@42c
Carpenters', White.....gro. 36@38c
See also Crayons.

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's.....40&10%
Columbia.....50&10%
Eclipse.....60@60&10%

Chisels—
Socket Framing and Firmer
Standard List.....70c&10@75c&10%
Buck Bros.....30%
Charles Buck.....30%
Swan's.....70&10&2½%
L. & I. J. White.....30@30&5%

Tanged—
Tanged Firmers.....40c&5@40&10%
Buck Bros.....30%
Charles Buck.....30%
L. & I. J. White, Tanged.....25&5%

Cold—
Cold Chisels, good quality.lb. 14@16c
Cold Chisels, fair quality.....*lb. 12c*
Cold Chisels, ordinary.....*lb. 8@9c*

Chucks—
Beach Pat., each $8.00.....20%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard 30%
Drill Chucks, New Model.....2 %
Independent Lathe Chucks.....40%
Improved Planer Chucks.....20%
Universal Lathe Chucks.....40%
Face Plate Jaws.....35%
Union Mfg. Co.:
Combination.....40%
Czar Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%

Clamps—
Adjustable, Hammers'.....20@20&5%
Adjustable, Stearns'.....30%
Cabinet, Sargent's.....45&10%
Carriage Makers', P., S. & W. Co..40&10%
Carriage Makers', Sargent's.....50&10%
Beaver, Parallel.....33⅓&10%
Lineman's, Ucica Drop Forge & Tool Co.....40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Walk—
Star Socket, All Steel....₱ doz. $4.00 net
Star Shank, All Steel....₱ doz. $3.75 net

Cleavers, Butchers'—
Foster Bros.....30%
New Haven Edge Tool Co.'s...40@40&5%
Nichols Bros., Flat hdl., 30%; Rd. hdl., 40%
Fayette R. Plumb.....5%
P., S. & W.....33⅓&5@33⅓&10%
& I. J. White.....25%

Clippers—
Chicago Flexible Shaft Company:
Handy Toilet.....₱ doz. $7.20
Mascotte Toilet.....₱ doz. $8.40
Monitor Toilet.....₱ doz. $9.00
Stewart's Patent.....₱ doz. $10.00

Clips, Axle—
Eagle and Superior ¼ and 5-16 inch.....65c&10@70%
Norway, ¼ and 5-16 inch...65@65c&5%

Cloth and Netting, Wire
—*See Wire, &c.*

Cocks, Brass—
Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.).....
60c&10@60c&10c&10%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list.....40%
Embossed, Gilt, Pope&Stevens'list30&10%
Leather, Pope & Stevens' list.....40%

Compasses, Dividers, &c.
Ordinary Goods.....70c&10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65&10%
Calipers, Inside or Outside.....65&10%
Calipers, Wing.....60%
Compasses.....50&5%
J. Stevens A. & T. Co.....25&10%

Conductor Pipe, Galvanized—

	Carload. Loose.	L. C. L. Nested.
Territory.		
Eastern....6)@25c&5%		60c&20c&2½%
Central....60&25c&2½%		60c&17½%
Southern... 60c&20c&5%		60c&15%
S. Western. 60c&20%		60c&12½%

Terms, 2% for cash.
See also *Eave Trough.*

Coolers, Water—
S. S. & Co.: 2-gal., $14.00; 3-gal., $16.00; 4-gal., $18.50; 6 gal., $23.00.

Coopers' Tools—
See *Tools, Coopers'.*

Cord— Sash—
Braided, Drab.....lb. 22@25c
Braided, White, Common, ..lb16@18c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India.....lb 8½@9½c
Cotton Sash Cord, Twisted....12@16c
Patent Russia.....lb. 12 @13c
Cable Laid Russia.....lb. 13½@14c
India Hemp, Braided.....lb 14@15c
India Hemp.....lb. 10@12c
Patent India.....lb. 10@12c
Pearl Braided, cotton.....₱ b 16@18¢
Massachusetts, White.....₱ b 20¢
Massachusetts, Drab.....₱ b 24¢
Eddy tone Braided Cotton.....₱ b 18¢
Harmony Cable Laid Italian....₱ b 18¢
Ossawan Mills:
Crown, Solid Braided White...₱ b 18¢
Braided, Giant, White.....₱ b 17¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phœnix, White.....18¢
Samson:
Braided, Drab Cotton.....₱ b 31¢
Braided, Italian Hemp.....₱ b 31¢
Braided, Linen.....₱ b 44¢
Braided, White Cotton, Spot...₱ b 27¢
Silver Lake:
A quality, Drab, 40¢.....15&10%
A quality, White, 35¢.....15&10%
B quality, Drab, 35¢.....15&10%
B quality, White, 30¢.....15&10%
Italian Hemp, 40¢.....15&10%
Linen, 57½¢.....15&10%

Wire, Picture—
Braided or Twisted.....70@70c&10%

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers, Nut—
Little Giant.....₱ gr. $24.00
Turner & Seymour Mfg. Co.....50%

Cradles—
Grain.....50%

Crayons—
White Round Crayons, gross...5@6c
Cases, 100 gro., $4.50@$5.00, at factory.
Metal Workers' Crayons..gr. $2.50 } Case lots 20%
Soapstone Pencils, round, flat or square.....gr.$1.50 } Case lots 20%
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition). gr. $2.00 } Case lots 20%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden.....₱ doz. $10.00

Cutters—Glass—
Smith & Heminway Co.....30%

Meat—
American.....30%

Nos.	1	2	3	4	5	6
Each	$5	$7	$10	$25	$50	$60

Connecticut:

Nos.	0	1	8	10	12
each	$1.75	2.25	3.00	8.00	9.50

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$3.50	$4	$6

Dixon's, ₱ doz.....33⅓&10%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Hale's, ₱ doz.....60&10&10@70%

Nos.	11	12	13
	$27.00	$33.00	$45.00

Home No. 1, ₱ doz. $26.00.....60%
Little Giant, ₱ doz.....33⅓&5@5&5%

Nos.	305	310	312	340	322
	$35.00	$48.00	$44.00	$75.00	$68.00

Miles' Challenge, ₱ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

New Triumph No. 605, ₱ doz. $24.00.....33⅓&5%
Woodruff's, ₱ doz.....40%

Nos.	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₱ doz. $60.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—
Henry Disston & Sons':
Slaw, Cabbage Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....50@50&10%
Slaw Cutters, 1 Knife, ₱ gr....$15@$18
Slaw Cutters, 3 Knife, ₱ gr....$20@$27

Tobacco—
All Iron, Cheap.....*doz. $4.25@$4.50*
Enterprise.....25@30%
National, ₱ doz. $21.00.....40%
Sargent's, ₱ doz. $24.00.....60@60&10%

Washer—
Appleton's, ₱ doz. $16.00.....60&10@60&10&10%
Bonney's.....₱ doz. $4.75

Diggers, Post Hole, &c.—
Iwan's Improved Post Hole Auger....40%
Iwan's Perfection Post Hole Digger.....₱ doz. $10.00
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $12; No. 3, $11; No. 4, $12.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill..each $1.75@$2.00
Blacksmiths' Self-feeding.....each $3.75@4.00
Bench Drills, Stearns'.....50%
Breast, Millers Falls, each $3.00..15&10%
Breast, P., S. & W.....30@30&10%
Goodell Automatic Drills..40&5@40&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....20@25%
Ratchet, Whitney's, P. S. & W....40&10%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓&5%

Twist Drills—
Standard List.....65@65c&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Balsey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....27½%
Champion.....40&10%
Douglass Mfg. Co.....20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay & Parsons' Ratchet.....35%
Goodell's Automatic 50&10&10@50&10&10&5%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....45&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1,50,55 and 60.50&10@50&10&10%
Nos. 20 and 40.....66⅔@66⅔&10%
Screw Driver Bits.....₱ doz. 50@70¢
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles.....70&10%
No. 86.....75&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory.	*Carload.*	*L. C. L.*
Eastern.....	75c&15%	75c&10%
Central.....	75c&12½%	75c&7½%
Southern.....	75c&10%	75c&5%
S. Western.....	75c&2½%	75%

Terms, 2% for cash.
See also *Conductor Pipe.*

Egg Beaters—See *Beaters, Egg.*

Emery—*Nos. 4 to 54 to Flour, CF*

	48 gro.	*180 gro.*	*F. FF*
Kegs.....	*lb. 4½c*	*5 c*	*5 c*
½ Kegs....	*lb. 4¾c*	*5¼c*	*5¼c*
¼ Kegs....	*lb. 5 c*	*5½c*	*5½c*
10-lb cans, 10 in case.....	*6 c*	*6¼c*	*5¼c*
10-lb. cans, less than 10....	*10 c*	*10 c*	*8c*

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's.....50&10%

Faucets—
Cork Lined.....70c&5@70c&10c&5%
Metallic Key, Leather Lined.....70@70c&10%
Red Cedar.....60@60c&5%
B. & L. B. Co.:
West's Lock, Open and Shut Key50&10%
John Sommer's Peerless Tin Key.... 40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined. 50&10%
John Sommer's Common Cork Lined.70%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's Perfection Cedar....40%
Star.....60@60&5%
Star, Metal Plug new list.....40@40&5%
Lockport, Metal Plug, reduced list.60&5%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40%
Lane's, ₱ doz. $36.00.....33⅓%
National Measuring, ₱ doz. $66.00...40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands.....70@75%
Good Brands.....75c&5@75c&10c&5%
Fair Brands.....75c&10c&5@80c&5%
Second Quality.....80c&10@80c&25%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....25%

Fixtures, Grindstone—
Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz.	*$3.30*	*3 55*	*3.75*	*4.50*	*5.25*

Stowell's Giant Grindstone Hanger.....₱ doz. $6.00
Stowell's Grindstone Fixtures.....50%
P., S. & W. Co.....50&10&10%
Reading Hardware Co.....30&20&10%
Sargent's Patent.....60c&10@60&10&10%

Fluting Machines—
See *Machines, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Aug. 1, 1899, list.
Hay, 2 tine.....25%
Hay, 3 tine.....66⅔%
Manure, 4 tine.....70%
Manure, 5 and 6 tine.....70%
Spading.....70c&5%
Iowa Dig-Ezy Potato.....25%
Victor, Hay.....70%
Victor, Manure.....70&8%
Victor, Header.....70&12½%
Champion, Hay.....60&20%
Champion, Manure.....70&5%
Columbia, Hay.....66⅔&c%
Columbia, Manure.....70%
Columbia, Spading.....70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
Plated.—See *Spoons.*

Frames—
Saw—
Red, Polished and Varnished..doz. $1.05@$1.10
White.....*doz. 75@80c*

Screens, Window and Door—
Bonanza Window Screens..50&10&2½%
Maine Window Screen Frame..40&10&5%
Phillips' Window Screen Frames.....60%
Porter's Extension Window Screens. 50&10%
Wabash Spring Adj. Screen.....50%
Warner's Screen Corner Irons.....50%

Freezers, Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best.	*$1.40*	*1 60*	*1.85*	*2.30*	*3.00*	*3.90*
Good	*$1 25*	*1.35*	*1.70*	*2 05*	*2 65*	*3.50*
Fair.	*$1.00*	*1.10*	*1 50*	*1.75*	*2.30*	*3.00*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—

	Per 1000 Feet.
Hemp Fuse	*$2.60*
Cotton Fuse	*2.90*
Single Taped Fuse	*3.50*
Double Taped Fuse	*4.70*
Triple Taped Fuse	*5.70*

See List

Gates, Molasses and Oil—
Stebbin's.....80@80c&10%

Gauges—
Marking, Mortise, &c......60c&10@60c&10c&10%
Barrett's Comb. Roller Gauge.....₱ doz. $6.75@7.25
Stanley R. & L. Co.'s Butt & Rabbet Gauge.....25&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....10@10&25%

Gimlets—
Nail, Metal, Assorted.gro. $1.40@1.75
Spike, Metal, Assorted gro. $3.00@3.50
Nail, Wood Handled, Assorted. gro. $4.00@4.50
Spike, Wood Handled, Assorted gro. $5 00@5.25

Glass, American Window
List Nov. 13, 1898.
Small lots from store:
Eastern.....80&10@80&20%
Western.....80&10@80&20%
From Jobbers or Factory, with Freight Allowance:
Carloads. Single Strength.....90%
Carloads. Double Strength...90&10%

Glue—Liquid, Fish—
List A, Bottles or Cans, with Brush. 37½@50%
List B, Cans (½ pts., pts., qts.)..... 33½@48%
List C, Cans (½ gal., gal.) ....25@45%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Common Grade.....gro. $5.00@6.00
Allerton's Axle:
1 lb Tins, ₱ gr.....$9.00
3 lb Tin Pails, ₱ doz., $2.00; 5 lb, $3.00; 10 lb, $6.00.
25 lb wood pails.....₱ doz. $12.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs., ₱ doz. 1 lb $1.20; 2 lb $2.00

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
gro.
Peg Patent, Leather Top..$4.90@5.25
Peg Patent, Plain Top....$3.50@3.75
Sewing, Brass Ferrule. ...$1 50@1.60
Saddlers', Brass Ferrule..$1 35@1.45
Peg, Common.....$1.25@1.35
Brad, Common.....$1.50@1.75

Halters and Ties—
Covert Mfg. Co., Web.....45&2%
Covert Mfg. Co., Jute Rope.....45&2%
Covert Mfg.Co., Sisal Rope.....30&2%
Covert's Saddlery Works', 98 list, W-b.. 60&10%
Covert's Saddlery Works, Leather60&10%
Covert's Saddlery Works, Jute....60&5%
Covert's saddlery Wo ks, Sisal.....60%
Covert's Saddlery Works, Manila..60&5%
Covert's saddlery Works, Cotton.....70%

Hammers—
Handled Hammers—
Heller's Machinists'.....40@40&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40&10%
Peck, Stow & Wilcox.....40@40&5%
Fayette R. Plumb:
Artisans' Choice, A. E. Nail....33⅓&5%
Engineers' and B. S. Hand.....50&10%
Machinists' Hammers.....50&10%
A. E. & A. E., Bell Face Nail....33⅓&5%
Riveting and Tinners'.....33⅓&5%
Sargent's C. S. New List.....45@45&10

Heavy Hammers and Sledges—
3 lb. and under...lb. 45c
3 to 5 lb .....lb. 36c } *70c&10@75*
Over 5 lb.....lb. 30c } *&10%*
Note.—Lower prices sometimes made by jobbers.
Wilkinson's Smiths'.....9½c@10c lb.

Handcuffs and Leg Irons
See *Police Goods.*

Handles—
Agricultural Tool Handles—
Hoe, Rake, Fork, &c.....50&10@60%
Shovel, &c., Wood D Handle.50@50&5%

Cross-Cut Saw Handles—
Atkins'.....40&5%
Champion.....45@45&10%
Disston'.....50%

Mechanics' Tool Handles—
Auger, assorted.....gro $2 40@2.60
Auger, large.....gro. $2 85@3.00
Brad Awl.....gro. $1.50@1.75
Chisel Handles:
Apple Tanged Firmer, gro ass'd. $2.25@2 35; large, $2.75@3.00.
Hickory Tanged Firmer. gro ass d. $1.75@2.25; large, $2 35@2.50.
Apple Socket Firmer, gro ass'd, $1 75@2.25; large, $2.25@2 50
Hickory Socket Firmer, gro ass'd. $1.60 @ $1.75; large, $1.75 @ $2.00
Hickory Socket Framing.gro.ass'd. $2.50@$2.75; large, $2.65@2.85
File, assorted.....gro. $1 00@$1.15
Hammer, Hatchet, Axe. &c...50&10%
Hand Saw, Varnished, doz. 75@80c
Not Varnished.. .....55@60c
Plane Handles:
Jack, doz. 23@25c; Jack Bolted.. 55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c

Hangers—
Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Doz	*$1.10*	*1.45*	*1.80*	*2.10*	*2.75*

Barn Door, New England Pattern, Check Back, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*
Doz	*$1.50*	*2.00*	*2 60*	*3.25*

Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Advance.....55%
Cleveland.....60%
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Car Ball Bearing, ₱ doz. pair $8.50
No. 10 Roller Bearing .doz. pr. 5.50
No. 20 Roller Bearing .doz. pr. 4.50
Nickel.....50%
J. G. C.....50&2&10%
Lane Bros.:
Parlor, Standard.....40&5&2½%
Parlor, New Model.....40&5½%
Barn Door, Standard.....60&2½%
Covered.....50&10&10%
Special.....60&5%
Lawrence Bros.:
Crown.....60%
New York.....60%
Sterling.....60%
McKinney Mfg. Co.:
No. 2, Standard, $18.....60&10%
No. 1, Special, $13.....60&10%
Stowell Mfg. and Foundry Co.
Badger.....60%
Baggage Car Door.....33⅓%
Climax Anti-Friction.....50%
Elevator.....40%
Interstate.....50&10%
Magic.....50%
Matchless.....50&10%
Nansen.....50&10%
Parlor Door.....50%
Railroad.....50&10%
Street Car Door.....50&10%
Steel, Nos. 300, 400, 500.....40&15%
Wild West.....50&5%
Zenith for Wood Track.....50&10%
Taylor & Boggs Foundry Co.:
Kidder's.....50&50&10%
Van Wagoner & Williams Hdw Co.:
American Trackless.....33⅓&10%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
L. T. Roller Bearing.....60&10%
New Era.....50&10%
New Richards.....60%
O. K. Roller Bearing.....60&10&5%
Prindle Improved.....60&10%
Richards' Improved.....60&10%
Richards' Single Track. ....50&10%
Wilcox Dwarf Roller Bearing.... 40&10%
Wilcox-Ives.....60&10%
Wilcox Tandem Roller Bearing.... 60&10%
Wilcox Trolley Ball Bearing..... 40%
Wilcox Trolley Roller Bearing..50%
Wilcox Trolley Roller Bearing, Fire.....40&10%

Extra 5@10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—
McKinney's Perfect Hasp, ₱ doz. $1.10 40&10%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—
Best Brands.....40&10@50%
Cheaper Brands....50&10@50&10&5%
Note.—Net prices often made.

Hay and Straw Knives—
See *Knives.*

Hinges—
Blind Hinges—
Lull & Porter Old Style Shutter:

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0 70*	*.65*	*.60*	*.53*

1868 Old Pattern Blind Hinge:

No.	*1*	*3*	*5*
Doz. pair	*$0.80*	*1.45*	*2.85*

Parker.....70@75%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5.....60½&10%
Sargent's, Nos. 11 & 13.....7 &10@70&10&10%
Wrightsville H'dware Co.:
Acme, Lull & Porter.....65&10&5%
Buffalo Gravity Locking, Nos. 1, 3 and 5.....65&10&10%
Champion Gravity Locking, No. 75.75%
1868, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pattern, Nos. 1, 3 and 5.....75%
Double Locking, Nos. 20 and 25.....70%
Empire, Nos. 101 and 103.....65&10%
Niagara Gravity Locking, Nos. 1, 3 and 5.....65&10&10%
Noiseless, Nos. 50, 60, 65 and 55..... 65&10&5%
O. S. Lull & Porter.....65&10&10%
Pioneer, Nos. 060, 45 and 5½..... 65&10&5%
Steamboat Gravity Locking, No. 10.. 75%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets $1.20.....20&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with Latches	*$1.90*	*2.50*	*4.25*
Hinges only	*1.30*	*1.55*	*3 20*
Latches only	*0.70*	*0.70*	*1.20*

New England:
With Latch.....doz. $1.75@1.80
Without Latch ....doz. $1.40@1.45
Reversible Self-Closing:
With Latch.....doz. $1.65@1.75
Without Latch.....doz. $1.30@1.35
Western:
With Latch.....doz. $1.60@1.65
Without Latch.....doz. $1.00@1.05

Spring Hinges—
Holdback, Cast Iron..... gro $7.00@7.50
Non-Holdback, Cast Iron..... gro. $6 00@$6.50

J. Bardsley:
Bardsley's Patent Checking.....10%
Bommer Bros.:
Bommer's.....40%
Chicago Spring Butt Co.:
Chicago.....20%
Garden City Engine House..20%
Keene's Saloon Door.....20%
Triple End.....40%
Coleman Hdw. Co.:
Champion Holdback....₱ gr. $9.00
J. G. C.....₱ gr. $9.00
Nickel.....₱ gr. $9.00
Lawson Mfg. Co.:
Matchless.....25%
Matchless Pivot.....40%
Payson Mfg. Co.:
Oblique, Dbl. Acting.....50@50&5%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr..... $2.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....45%
Van Wagoner & Williams Hdw. Co.:
Acme.....30&5%
American.....30%
Columbia, No. 14.....₱ gr. $8.00
Columbia, No. 18.....₱ gr. $24.00
Crown.....30%
Gem.....30%
Knoxall.....₱ gr. $9.00
Oxford.....30%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list Mar. 15. 1898:
Light Strap Hinges..66⅔%
Heavy Strap Hinges..70%
Light T Hinges....50&10%
Heavy T Hinges...60&10%
Extra Heavy T Hinges... 66⅔% } *Extra 20%@25%*
Hinge Hasps 45%
Stanley's Corrugated Heavy Strap.....70%
Stanley's Cor. Ex. Heavy T. 66⅔%
Note.—Change in base discounts.
Rolled Plate.....70@70&5%
Screw Hook and Strap. { *6 to 12 in..lb 3½@3¾c* / *14 to 20 in..lb. 3¼@3½c* / *22 to 36 in...lb. 3 @3¼c*
Screw Hook and Eye:
¾@1 inch.....lb 5½@5¾c
⅝-inch.....lb. 6½@6¾c
½-inch.....lb. 8½@8¾c

Hoes—
Eye—
Scovil and Oval Pattern..... 60&5@60&10&5%
Grub, list Feb. 23, 1899....65@65&10%
D. & H. Scovil.....35@35&5%
Handled—
Aug. 1, 1899, List:
Field and Garden.....75&2%
Ladies', Boys', Toy and Onion... 70&10&10%
Street and Mortar .....75&7½&2%
Cotton.....70&10&10&5&2%
Planters'.....70&30%
Weeding.....75%
Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Crucible Garden Hoe..... 75&3%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10&2%
Ft. Madison Mattock Hoe, ₱ doz....$4.50
Ft. Madison Sprouting Hoe, ₱ doz..$4.80
Ft. Madison Dixie Tobacco Hoe..... 75&20%
Kretsinger's Cut Easy, per doz....75&2%
Warren Hoe.....60%

Hog Rings and Ringers—
See *Rings and Ringers.*

Hoisting Apparatus—
See *Machines, Hoisting.*

Hollow Ware—
See *Ware, Hollow.*

Holders—
Bit—
Angular, ₱ doz. $24.00.....45&10%
File and Tool—
Nicholson File Holders and File Handles.....38⅓%

Hooks—
Cast Iron—
Bird Cage, Reading..... } .50&10@60%
Bird Cage, Sargent's List.. }
Clothes Line, Sargent's List.....35&10%
Ceiling, Sargent's List.....40@40&10%
Clothes Line, Stowell's.....70%
Clothes Line, Reading List 65&10@65&10&10%
Coat and Hat, Stowell's.....70%
Coat and Hat, Reading.....70@75%
Coat and Hat, Sargent's List.....35&10%
Coat and Hat, Wrightsville .....65&10%
Harness, Reading List.....70&10@75%
Wire—
Belt.....80@80&10%
Atlas, Coat and Hat.....50@50&10%
Czar Harness.....50&10%
Wire Coat and Hat:
Acme.....60@60&5%
B. B.....70@70&5%
V Brace, Chief and Czar.....50&10%
Gem.....50&10%
Bright Wire Goods—See *Wire.*
Wrought Iron—
Box, or Case, Octagon Steel.... doz. $2.10@2.20
Cotton.....doz. $1.05@1.15
Picture, T. & S. Mfg. Co.....75%
Tassel, T. & S. Mfg. Co.....50&10%
Wrought Staples, Hooks, &c.— See *Wrought Goods.*
Miscellaneous—
Bush, Light, doz. $5.50; Medium, $6 00; Heavy, $6.50
Grass.....Nos. 1 2 3 4
Best..... $1.50 1.75 2.00
Common. $1.40 1.50 1.50 1.75
Potato and Manure ..... 75&15%
Whiffletrees.....lb. 4½c
Hooks and Eyes:
Brass.....60&10&10@70%
Malleable Iron .....70&5@70&10%

Covert Saddler's Works' Self Locking Gate and Door Hook..... 60&10%
Crown Picture.....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—
See *Shoes, Horse.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....ft. 4¾@ 5¼c
3-ply Standard ..... ft. 5¼@ 6 c
4-ply Standard.....ft. 6½@ 6¾c
3-ply extra.....ft. 6½@ 7¼c
4-ply extra .....ft 7½@ 8¼c
High Grade .....ft 9 @11 c
Cotton Garden, ¾-in., coupled:
Low Grade ..... ft. 5¼@6c
Fair quality .....ft. 7 c
Good quality.....ft. 8 @ 8½c

Irons—
Sad—
From 4 to 10..... .....lb 3¼@3½c
B. B. Sad Irons..... .....lb. 3⅜@4c
Chinese Laundry.....lb. 5@5½c
Chinese Sad.....lb. 3¾@4c
Mrs. Potts', per set:

Nos.	*50*	*55*	*60*	*65*
	85@$1.00	*78@93c*	*95@1.10*	*89@1.03*

New England Pressing.lb.. 3¼@3½c

Soldering—
Soldering Coppers.....lb. 28@30c
Covert Mfg. Co.....20&2%

Pinking—
Pinking Irons.....doz. 50@60c

Jack Screws—See *Screws.*

Jacks, Wagon—
Covert Mfg. Co., Steel.....45&2%
Daisy.....70%
Ill. I. & B. Co Common.....70@75%
Lockport.....40@40&10%
Victor.....60%
Lane's Steel.....33⅓%

Kettles—
Brass, Spun, Plain, list Jan. 10, '99 15@20%
Enameled and Tea—See *Ware, Hollow.*

Knife Sharpeners—
See *Sharpeners, Knife.*

Knives—
Butcher, Shoe, &c.—
Dick's Butcher Knives.....40%
Foster Bros.' Butcher, &c.....80%
Nichols' Butcher Knives.....50%
Hay and Straw—See *Hay Knives.*
Corn—
Ft. Madison Cut-Easy, ₱ doz.....$3.25
Drawing—
Standard List.....70&10@75&....%
Adjustable Handle.....25@33⅓%
Bradley's.....35%
Swan's.....70&10&2½%
Watrous.....30&10&40%
L. & I. J. White.....20&5@25%
Cautelo's Folding.....50@50&5%
Hay and Straw—
Blizzard.....$5.75@6.00
Iwan's Sickle Edge.....₱ doz. $11.50
Lightning.....$7.50
Mincing—
Buffalo.....₱ gro. $15.00
Smith's, ₱ doz., Single, $2; Double, $3 45@50%
Miscellaneous—
Farriers'.....doz. $2 00@3.00
Wostenholme's.....₱ doz. $3.00@3.25
Knobs—
Base, 2¼-inch, Birch, Rubber tip, gro .....$1.50@1.55
Carriage, Jap, all sizes..gro. 30@33c
Door, Mineral.....doz. 75@80c
Door, Por. Jap d .....doz. 83@88c
Door. Por. Nickel....doz. $2 10@2.20
Bardsley's Wood Door, Shutter, &c...10%
Picture, Sargent's.....60&10%
Snow's Victor.....50&10%

Ladies—
Melting—
L. & G. Mfg. Co.....60%
P., S. & W.....40@40&10%
Reading.....50&10%
Sargent's.....40@40&10%
Lanterns—Tubular—
Regular Tubular..... doz. $4.00@4.50
Side Lift Tubular.... doz. $4.25@4.75
Square Lift Tubular .doz. $4.21@4 75
Other Styles.....40c10@40c10c&5%
Meyrose Side Lift Tubular, doz. $3.50... 45&10%
Bull's Eye Police—
2¾-inch flash light....doz. $3.50@3.75
3-inch flash light.....doz. $4.00@4 25
2¾ inch regular .....doz. $3.25@3.50
3-inch regular..... doz. $3.50@3.75
Latches, Thumb—
Roggin's Latches.....doz. 35c@45c
Lawn Mowers—
See *Mowers, Lawn.*
Leaders, Cattle—
Small.....doz. 45c; large, 55c
Covert Mfg. Co.....45&2%

Lemon Squeezers—
See *Squeezers, Lemon.*

Lifters, Transom—
Dickson:
3 x 4 ft. x ¼ ..... ₩ 100 $11.00
Other sizes, Iron ..... 70&10%
Other sizes, Brass and Bronze 70%
Excelsior ..... 60@60&10%
Payson's:
Solid Grip Nos. 643 and 644, ₩ 100, $11.00
Bronzed Iron 70%

Lines—
Wire Clothes, Nos... 18 19 20
100 feet $3.50 2 75 2 25
75 feet $1.75
Ossawan Mills.
Crown Solid Braided Chalk 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $5.50; No. 2, $7.00; No. 3, $7.50 ₩ gr. 30%

Locks, &c.— Cabinet—
Cabinet Locks ..... 33⅓@33⅓&7½%

Door Locks, Latches, &c.—
[Net prices are very often made on these goods.]
Reading Hardware Co. 40%
R. & E. Mfg. Co. ..... 42½ & 0%
Sargent & Co. ..... 40@40&10%
Slaymaker-Barry Co. ..... 30@35%
Snow's Victor ..... 50&10%

Elevator—
Stowell's 33⅓%

Padlocks—
Wrought Iron, list Dec. 5, '97 ..... 70@70&10%
Dog Collar, S. B. Co. 40%
R. & E. Mfg. Co. Wrt. Steel and Brass. 50%
S. B. & Co. 40%

Sash, &c.—
Fitch's Bronze and Brass 66⅔%
Fitch's Iron 70%
Ives' Patent ..... 62½&10@66⅔&10%
Payson's Perfect 70%
Payson's Signal (new list) 75%
Reading ..... 60&10&10@70%

Machines—

Boring—
Without Augers.

	Upright.	Angular.
Improved No. 3	$4.25	No. 1 $5.00
Improved No. 4	3.75	No. 2 3.38
Improved No. 5	2.75	
Jennings'	2.50	3.00
Milliers' Falls		4.75
Snell's, Rice's Pat.	2.50	2.75
Swan's, No. 500	5.10	No. 200 6.45

Hoisting—
Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%

Washing—
Wayne American, ₩ doz. $27.00
Western Star, No. 2, ₩ doz. 28.00
Western Star, No. 3, ₩ doz. 30.00
St. Louis, No. 41, ₩ doz. 60.00
Carload lots 10% off. freight allowed.

Mallets—
Hickory ..... 45&5@50&5%
Lignumvitæ ..... 45&5@50&5%
Tinners', Hickory and Applewood, doz. ..... 50@55c
Fiber Head Stearns' ..... 30&10%

Mats—
Door—
Elastic Steel (W. G. Co.) 10%

Mattocks—
List Feb. 23, 1899 ..... 65@65&10%

Meat Cutters—
See *Cutters, Meat.*

Milk Cans—See *Cans, Milk.*

Mills— Coffee—
Box and Side, list Jan. 1, '88 ..... 60&5@60&10&5%
Net prices are often made on some goods which are lower than above discounts.
Enterprise Mfg. Co., list Jan. 17, '03 .. 30%
National, list Jan. 1, '94 ..... 30%
Parker's Columbia and Victor .... 60&10%
Parker's Upright ..... 30&10@40%
Swift, Lane Bros. 30%

Mincing Knives—
See *Knives, Mincing.*

Molasses Gates—
See *Gates, Molasses.*

Money Drawers—
See *Drawers, Money.*

Mowers, Lawn—
Net prices are generally quoted.

	10	12	14	16-inch
Cheap				$1.75@$2.00
Good	3.00	3.25	3 50	3.75
High Grade	4 00	4.25	4.50	4 75

Pennsylvania and Continental 60&10&5%
Quaker City ..... 70&5%
Great American ..... 70&5%
Philadelphia:
Styles M., S., C., K., T. ..... 70&10%
Style A, all Steel ..... 60&10%
Style E, Low Wheel ..... 60&10%
Style E, High Wheel ..... 70&10%
Drexel and Gold Coin, low list 50%

Nails—
Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899.. ... 80@80&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10
A. C.	25¢	23¢	22¢	21¢	21¢

40&5%

Capewell	19¢	18¢	17¢	16¢	16¢10&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢...40%
Champlain	28¢	26¢	25¢	24¢	23¢ 40&5&2%
Maud S.	25¢	23¢	22¢	21¢	21¢...50%
Neponset	23¢	21¢	20¢	19¢	18¢...40%
Putnam	23¢	21¢	20¢	19¢	18¢.33⅓%
Standard	23¢	21¢	20¢	19¢	18¢...40%
Star	23¢	21¢	20¢	19¢	18¢ 35& 5%
Vulcan	23¢	21¢	20¢	19¢	18¢ 25&10%

Picture—

	1¼	2	2½	3	3½ in.
Brass Head	.45	.60	.70	.95	1.00 gro.
Por. Head	..	1.10	1.10	1.10	.. gro.

Nippers, See *Pliers and Nippers.*

Nut Crackers—
See *Crackers, Nut.*

Nuts—
List Feb. 1, '99.
Cold Punched. Off
Mfrs. or U. S. Standard. list.
Hexagon, plain ..... 3.90@4.10c
Square, plain ..... 3.90@4.10c
Square, C. T. & R. ..... 3.70@3.90c
Hexagon, C. T. & R. ..... 4.20@4.40c
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square ..... 4.30@4.50c
Hexagon ..... 4.50@4.70c
NOTE.—*Tapped Nuts are now 2-10c. higher than above.*

Oakum—
Best or Government ..... lb. 5¼c
Navy ..... lb. 4¾c
U. S. Navy ..... lb. 5¼c
Plumbers' Spun Navy 2¾c
In carload lots ¼c lb. off f.o b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper ..... 40&10@50%
Tin or Steel ..... 60&10&10@70&5%
Zinc ..... 60&5@65%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Wilmot & Hobbs Mfg. Co .... 70@70&10%

Openers, Can—
French ..... doz. 35c
Iron Handle ..... doz. 25@27c
Sprague, Iron Hdle..per doz 35@40c
Sardine Scissors...doz. $1.75@$3.00
National, ₩ gro. ..... $1.75@$2.00
Stowell's ..... per doz. 40@45c

Packing—
Rubber—
Standard, fair quality .... 70&10@75%
Inferior quality ..... 75&10@80%
Extra ..... 60&5@60&10&5%
Jenkins' Standard, ₩ ℔ 80¢.... 25@25&5%

Miscellaneous—
American Packing ..... 9@10c lb.
Cotton Packing ..... 13@14c lb.
Italian Packing ..... 10½@11¼c lb.
Jute ..... 5@5¼c lb.
Russia Packing ..... 12@13c lb.

Pails—
Creamery—
S. S. & Co., with gauges.. No 1 $6.50; No. 2, $6.75 ₩ doz.

Galvanized—

Inch	10	12	14
Water, Standard, gro	$23 00	$26 00	$29.00
Water, Regular	19 00	22.00	25.00
Water, Heavy	22.00	25.50	28.00
Fire, Rd. Bottom, gro	31.00	33.00	35.00
Well, gro	27.00	29.00	31.00

Pans—
Dripping—
Large Sizes ..... lb. 4¾c
Small Sizes ..... lb. 5¼c
Fry—
Standard List ..... 75¢1⁰⁰@80%

Roasting and Baking—
Regal, S. S. & Co., ₩ doz., Nos. 5, $4.50; 10, $5.00; 20, $5.50; 30, $6.00
Simplex, ₩ gro., No. 40, $30.00; 50, $34.50; 60 $39 00; 140, $33.00; 150, $37 50; 160, $43.00.

Paper—
Building Paper—

	Per roll
Rosin Sized Sheathing:	*500 sq. ft.*
Light wt, 20 sq. ft. to lb.	*$0 40@0.45*
Medium wt., 12 sq. ft. to lb	*$0.60@0.65*
Heavy wt., extra quality	*$0.95@1.05*
Medium Grades Water Proof Sheathing	*$0 80@1.25*
Deafening Felt, 9, 6 and 4½ sq ft. to lb., ton	*$45.00@50.00*
York Haven Waterproof Sheathing	$1 35@1.75

Tarred Paper.
1 ply (roll 500 sq ft.), ton..$35 00@40.00
2 ply, roll 100 sq. ft 90c
3 ply, roll 100 sq. ft $1.20

Sand and Emery—
List Dec. 23, 1899..50&10@50&10&10%
see *Trade Report.*

Parers—
Apple—

Advance	₩ doz.	$4.50
Baldwin	₩ doz.	$5.00
Bonanza	each	$5.00
Dandy	each	$7.50
Eureka, 1888	each	$16.00
Family Bay State	₩ doz.	$12.00
Hudson's Ll tle Star	₩ doz.	$4.00
Hudson's Ro'king Table	₩ doz	$5.50
Improved Bay State	₩ doz.	$27.00@30.00
New Lightning	₩ doz.	$5.50
Reading 72	₩ doz.	$4.00
Reading 78	₩ doz.	$7.00
Turn Table '98	₩ doz.	$5 50
White Mountain	₩ doz.	$4.00

Potato—

Saratoga	₩ doz.	$5.50
White Mountain	₩ doz.	$4.50

Picks and Mattocks—
List Feb 23, 1899 ..... 65@65&10%

Pinking Irons—
See *Irons, Pinking.*

Pins—
Escutcheon—
Brass ..... 60@60&5%
Iron, list Nov. 11, '85 ..... 60@60&5%

Pipe, Cast Iron Soil—
Factory Shipments.
Standard, 2-6 in ..... 50@50&10%
Extra Heavy, 2 6 in ..... 50&10@60%
Fittings ..... 60@60&10%

Pipe, Wrought Iron—
Factory Shipments.
List February, 1899.
Plain and Galvanized:
Carload lots ..... 50&10&10%
Less than carload lots...60&10&2½%
Screw and Socket Casing.... 37½&5%
Inserted Joint Casing ..... 32½&5%
Cold Drawn Seamless Steel Tubing.. 60%

Planes and Plane Irons—
Wood Planes—
Molding ..... 40&2½@40&5%
Bench, First quality ..... 45&10@45&10&5%
Bench, Second quality ..... 50&10@50&10&5%
Bailey's (Stanley R. & L. Co) 50&10&10@50&10&10&10%
Gage Self Setting 35%

Iron Planes—
Bailey's (Stanley R. & L. Co) ..... 50&10&10@50&10&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10&10@25&10&10&10%
Sargent's ..... 50&10@60%

Plane Irons—
Wood Bench Plane Irons. 35@35&10%
Buck Bros. 30%
Butcher's ..... $5.00@5.25 to £
Stanley R. & L. Co... 50&10@50&10&10%
L. & L. J. White ..... 20&5@25%

Plates—
Felloe ..... lb 3½@3¾c
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00 ..... 50%

Pliers and Nippers—
Button Pliers ..... 65&10@70&5%
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45.
Gas Pipe.. 7 8 10 12-in
$1.75 $2.00 $2.75 $3.75
Acme Nippers ..... 40@40&5%
Bernard's:
Parallel Pliers, &c 33⅓%
Paragon Pl ers 50%
Lodi Pliers 50%
Elm City Fence Pliers 33⅓%
Heller's Farriers' Pincers and Tools ..... 40@40&5%
Morrill's Parallel, ₩ doz. $12.00...30&5%
P., S. & W. Cast Steel ..... 30&10@40%
P., S. & W. Tinners' Cutting Nippers, 40@40&5%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Plumbs and Levels ..... 70¢10¢10@75¢10¢10%
Disston's 70%
Pocket Levels ..... 75&10&10@75&10%
Stanley R. & L. Co. ..... 70&10&10@77½&10&10%
Stanley's Duplex ..... 25&10@25&10&10%
Woods' Extension 33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ₩ doz., No. 1, $7.20; No. 2, $11.00; No. 3, $11.00; No. 4, $14.50 ..... 50%

Points, Claziers'—
Bulk and 1 lb. papers.. lb. 10¼@11¼c
½-lb. papers ..... lb. 11 @12 c
¼-lb. papers ..... lb. 11½@12½c

Pokes, Animal—
Ft. Madison Hawkeye ..... ₩ doz. $3.25
Ft. Madison, Western ..... ₩ doz. $3.75

Police Goods—
Manufacturers' Lists ..... 25@25&5%
Tower's 25%

Polish—Metal—
Prestoline Liquid, No. 1 (½ pt.), ₩ doz. $3.00; No. 2 (1 qt.), $9.72 ..... 40%
Prestoline Paste ..... 33⅓&40%
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gr. $4.50; ½ ℔ boxes, ₩ doz. $1.25; 1 ℔ boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz. $1.25; ₩ gr. $12.00.
Barkeepers' Friend Metal Polish, ₩ doz. $1.75; ₩ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₩ doz. $1.50

Stove—
Black Eagle Benzine Paste, 5 ℔ cans ... ₩ ℔ 10¢
Black Eagle, Liquid, ¼ pt. cans ..... ₩ doz. 75¢
Black Jack Paste, ¼ ℔ cans, ₩ gro. $9.00
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ ℔ 8¢
Fireside ..... ₩ gr. $2 50
Gem, ₩ gr. $4.50 ..... 10%
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, ½ pt. cans ..... ₩ doz. $1.50
Wynn's Black Silk, 5 ℔ pail ... ₩ ℔ 12¢
Wynn's Black Silk, ½ ℔ box, ₩ doz. $1.00
Wynn's Black Silk, 5 oz. box, ₩ doz. $0.75
Wynn's Black Silk, 8 oz. liq., ₩ doz. $1.00

Poppers, Corn—
Round or Square:
1 qt ..... gro. $7 00@$8.00
1½ qt ..... gro 9 50@ 10 50
2 qt ..... gro. 10.50@ 11.50
Quincy Corn Popper, 1 qt., ₩ gr. $16.50; 2 qt., $19.00.

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Potato Parers—
See *Parers, Potato.*

Pots— Glue—
Enameled ..... 40&5@40&10%
Tinned ..... 40@40&5%

Powder—
In Canisters:
Duck, 1 lb. each 45c
Fine Sporting, 1 lb each 75c
Rifle, ½-lb. each 15c
Rifle, 1-lb. each 25c
In Kegs:
Duck, 6½-lb. kegs $2.25
Duck, 12½-lb. kegs $4.25
Duck, 25-lb kegs $8.00
Rifle, 6¼-lb kegs $1.25
Rifle, 12½-lb. kegs $2.25
Rifle, 25-lb. kegs $4.00
King's Smokeless: 25&10&25%
Keg (25 ℔ bulk) $20 00
Half Keg (12½ ℔ bulk) $10.25
Quarter Keg (6¼ ℔ bulk) $5.25
Canister (1℔ bulk) $0.90
Case, 1 ℔ Canisters (50 ℔ bulk) $45.00
Half Case, 1 ℔ Canisters (25 ℔ bulk) $22.75
King's Semi-Smokeless: 20&25%
Keg (25 ℔ bulk) $16.00
Half Keg (12½ ℔ bulk) $8.25
Quarter Keg (6¼ ℔ bulk) $2.75
One Pound Can, bulk $0.50

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—
Crown, ₩ doz. $18.00 ..... 50%
Crown Prince, ₩ doz. $15.00 ..... 50%
Cyclops ..... 40@40&10%
Diamond B, No. 2, doz. $22.; No. 3, $11. ..... 40%
Eureka, 5 ℔ doz., $16.00; 3 ℔ $15 ..... 40%
Giant, No. 1, ₩ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%
National, ₩ doz. $24.00 ..... 50%
Miller's Falls, No. 3, per doz. $12.00 ..... 15&10%
Pelican, ₩ doz. $9.00 ..... 4 &10%
Scranton No. 1 and 2, ₩ doz. $9.00
Scranton, No. 3, ₩ doz. $8.50

Pulleys—

Hay Fork, Swivel or Solid Eye ..... *doz. $1.60@2.00*

Hay Fork, Stowell's Anti-Friction, 5-in. Wheel, ₱ doz. $12.00..... 40%
Hot House, Awning, &c.....60@60&10%
Japanned Clothes Line.....60@60&10%
Japanned Screw.....70&10&10%
Japanned Side.....70&10&10%
Stowell's Ceiling or End, Anti-Friction 60%
Stowell's Dumb Waiter, Anti-Friction .. 60&10%
Stowell's Electric Light..... .....60%
Stowell's Side, Anti-Friction.....60&10%
Sash (Auger Mortise):
Common Sense, 1¾ in., ₱ doz., 20¢; 2 in., 22¢.
Empire.....1¾ in., 17¢; 2 in., 19¢
Grand Rapids All Steel Noiseless..40%
L C.....1¾ in., 15¢; 2 in., 17¢
Ideal No. 13.....1¾ in. ₱ doz., 20¢
Improved.....1¾ in., 17¢; 2 in., 19¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy.....1¾ in., 16¢; 2 in., 19¢
Star.....1¾ in., 16¢; 2 in., 19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....*60@60@5%*
Pitcher Spout.....*70¢10@75%*
Pump Leathers, all sizes.....*gro. $6.00*
Flint & Walling's Fast Mail.....50@55%
Flint & Walling's Pitch-- Spout. 70&10%
Loud's Suction Pumps, U. S. Co.....20%
Myer's Pumps, low list 50%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....20%

Punches—

Revolving (4 tubes)...*doz. $3.75@4.00*
Saddlers' or Drive, good..*doz 65@70c*
Spring, good quality.....*$1.70@1.80*
Bemis & Call Co.'s Cast Steel Drive.50&5%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50&5%
Niagara Hollow Punches.....45%
Niagara Solid Punches... .....55%
Spring, Leach's Pat.....15%
Steel Screw, B & K. Mfg. Co.... ..40%
Tinners' Hollow, P., S. & W. Co..... 35@35&5%
Tinners' Solid, P., S. & W.Co., ₱ doz., $1.44.....55%

Rail—

Barn Door, &c.—

Barn Door, Light..*In.* ½ ⅝ ¾
100 feet..... *$2.00 $2.50 $3.00*
B. D., for N. E. Hangers:
Small. Med. Large.
100 feet.....*$2 20 2.70 3.20*
Sliding Door, Bronzed Wr't Iron, ft. 6¼¢
Sliding Door, Iron Painted....*2½@3c*
Sliding Door, Wrought Brass, 1½ in. ..... *lb. 36c..50%*
Cronk's Double Braced Steel Rail, ₱ foot..... 3½¢
Lanes' O. N. T., ₱ 100 ft., 1 inch....$3.00
Lanes' Standard, ₱ 100 ft..... .....4.25
Lawrence Bros.'.....₱ ft. 4½¢
McKinney's None Better.....₱ ft. 3¢
McKinney's Standard.....₱ ft. 3½¢
Moore's, Wr't. Bracket, Steel.....3½¢
Stowell's Steel Rail, Plain .....10¢

Rakes—

Aug. 1, 1899, List:
Cast Steel..... .....*70¢5¢2%*
Malleable.....*60%&*
Fort Madison Red Head Lawn. $3.25
Fort Madison Blue Head Lawn.....$3.00

Rasps, Horse—

Disston's 75%
Heller Bros..... .....60&10&10%
New Nicholson Horse Rasp.....70&10%
See also *Files.*

Razor Strops—

See *Strops, Razor.*

Reels—

Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes.....25%
Hendryx Single Action Series, 102P and PN 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N 302 and 302N, 02084N, Competitor.50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2004N, 2004P and PN, 002904PN, 0924 and 0924N, 5009N and PN.....40&10%

Registers—

For points on Mississippi River and East:
Black Japanned.....*30¢10%*
White Japanned.....*30¢10%*
Bronzed Finishes.....*30%*
Nickel Plated.....*30¢10%*
Electro Plated in Brass, &c..30¢10%
White Porcelain.....*20%*
Solid Brass and Bronze Metal..20%
Note.—Higher prices are quoted in territory further West.

Riddles, Grain or Sand—

16 in. per doz.....*$2.00@$2.25*
17 in. per doz.....*$2.25@$2.50*
18 in. per doz.....*$2.50@$2.75*

Rings and Ringers—

Bull Rings—

	2	2½	3 Inch.
Steel	$0.75	0.83	0.88 doz.
Conner	1.10	1.30	1.50 doz.

Hog Rings and Ringers—

Hill's Rings...*gro. boxes, $4.50@5.00*
Hill's Ringers, G. I......*doz. 75c*
Blair's Rings.....₱ gr. $5.75@6.00
Blair's Ringers.....₱ doz. $0.90@1 00
Brown's Rings.....₱ gro. $6.00@6.25
Brown's Ringers.....₱ doz $1.00@1.10c
Perfect Rings.....₱ gro. $9.00@9.50
Perfect Ringers. ₱ doz.....$1.25@1.35
Rapid Rings.....₱ gro. $6.00
Rapid Ringers.....₱ doz. $3.50

Rivets and Burrs—

Copper.....*40¢10@50%*
Iron or Steel:
Tinners' .....*53½@53½¢10%*
Miscellaneous .....*53½@53½¢10%*

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list.60&10&10@70%
Lane's, Stav ....33⅓&5%
Stowell's Barn Door Stay...₱ doz. $1.25

Rope—

NOTE.—*Carload lots, except on Jute Rope, ¼c. per lb. less than the following prices, which are for small lots.*

Manila, 7-16 in. and larger.
lb. .. *@15½c*
Manila.....*¾-inch lb.* .. *@16 c*
Manila..*¼ and 5-16 in. lb.* .. *@16¼c*
Manila, Tarred Rope, 15 thread.....*lb* .. *@15½c*
Manila Hay Rope Med'm.lb .. *@15½c*
Sisal.7-16 in. and larger.lb. .. *@10½c*
Sisal..... .....*¾-inch. lb.*... *@11 c*
Sisal.....*¼ and 5-16 in. lb.* .. *@11½c*
Sisal, Hay Rope, 2 to 10 ply.....*lb.* .. *@10½c*
Sisal, Tarred, Medium Lath Yarn.....*lb*... *@10 c*
Cotton Rope:
Best, ¼-in. and larger..lb. 13@14 c
Med'm, ¼-in. and larger lb. 10@12 c
Com., ¼-in. and larger.lb. 8@10 c
Jute Rope, No. 1, ¼ in. and up.....*lb.* .. *@7½c*
Jute Rope No. 2, ¼ in. and up.....*lb.* .. *@ 7c*

Wire Rope—

List July 1, '99.....*30¢2½%*

Ropes, Hammock—

Covert Mfg. Co.....45&2%
Covert Saddlery Works.....60%

Rules—

Boxwood..*75¢10¢10¢10@75¢10¢10 ¢10¢10¢10%*
Ivory....*40¢10¢10@40¢10¢10¢10¢10%*
Lufkin's Steel.....50&10%
Lufkin's Lumber ....50&10%
Stanley R. & L. Co.; Boxwood ..... 75&10&10@75&10&10&10&10%
Ivory..... .40&10&10@40&10&10&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—See *Paper and Cloth.*

Sash Cords—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Note.—Extra 5% often given on Circulars, Cross Cuts, &c., and extra 5@7½ on Hand, Butcher, &c.

Atkins' Circular..... .....50@50&10%
Atkins' Band .....50&10@60%
Atkins' Cross Cuts .....35&5%
Atkins' Mulay, Mill and Drag.....50&10%
Atkins' One-Man Saw.....40%
Atkins' Wood Saws 40%
Atkins' Hand, Compass, &c.... .....40%
Disston Circular Solid and Inserted Tooth.....50%
Disston Band 2 to 14 in. wide.....60%
Disston Band ¼ to 1¾.....70%
Disston Crosscuts.....50%
Disston Narrow Crosscuts.....55%
Disston Mulay, Mill and Drag..|.....50%
Disston Framed Woodsaws.....35%
Disston Woodsaw Blades.....40%
Disston Woodsaw Rods..... .....25%
Disston Handsaws, Nos. 12, 99, 9, 16, d100, D8, 120, 70, 77, 8.....25%
Disston Hand Saws, Nos. 7, 107, 107½, 8, 1, 0, 00, Combination.....30%
Disston Compass, Keyhole, &c.....25%
Disston Butcher Saws and Blades....35%
C. E. Jennings & Co.'s.....25&5@30&5%
Peace Circular and Mill.....50%
Peace Cross Cuts, list Jan. 1, '99.....50%
Peace Hand, Panel and Rip.....30%
Richardson's Circular and Mill.....50%
Richardson's X Cuts, list Jan. 1, '93, 45&10&5%
Richardson's Hand, &c..... .....30%
Simonds' Circular Saws.....50%
Simonds' Crescent Ground Cross Cut Saws.....35%
Simonds' One-Man Cross Cuts....40&10%
Simonds' Gang Mill, Mulay and Drag Saws.....45@45&5%

Hack Saws—

Disston Concave Blades.....25%
Disston Keystone.....30%
Disston Hack Saw Frames.....30%
Griffin's complete.....50@50&10%
Griffin's Hack Saw Blades....50@50&10%
Star Hack Saws and Blades..... 15&10%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete $4.00.....15&10%

Scale Beams—See *Beams, Scale.*

Scales—

Family, Turnbull's.... ...*30@30¢10%*
Hatch, Counter:
Platform, 4 lb. by ½ oz... *doz. $5.75*
Two Platforms, 8 lb. by ½ oz..... *doz. $16 00*
Union Platform, Plain....*$2.00@2.10*
Union Platform, Striped..*$2.15@2 25*
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Chatillon's Grocers' Trip Scales.....50%
Pelouze Scales—Family, Candy, Grocers' and Postal.....New list net
"The Standard" Portables 45%
"The Standard" R. R. and Wagon....50%

Scrapers—

Box, 1 Handle .....*doz $2.25@2.75*
Box, 2 Handle..... *doz. $3.75@4.00*
Ship, No. 1, doz. $3.50; No 2, $2.25@3.40
Adjustable Box Scraper (S. R. & L. Co.) $6.00..... .....40&10%
Foot, W. E. Pratt Mfg. Co. ₱ doz. $1.15@$1.25

Screen Window and Door Frames—See *Frames.*

Screw Drivers—See *Drivers, Screw.*

Screws—

Bench and Hand—

Bench, Iron..*doz. 1 in., $2.50@2.75; 1½, $2.85@3.10; 1¼, $3.35@3.50*
Bench, Wood, Beech..*doz. $3.50@2.75*
Hand, Wood.....*35@40%*
Hand, Grand Rapids.....35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....*65@65@....%*
Coach and Lag, Gimlet Point, list Oct. 1, '99.....*65@ ....%*
Hand Rail, list Jan. 1, '81....*82½@2%*

Jack Screws—

Millers Falls.....50&10&10%
Millers Falls, Roller .....50&10%
P., S. & W. .....40&5@40&10%
Sargent.....60&10@60&10&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.....*50%*
Flat or Round Head, Brass.....*50%*

Set and Cap—

Set (Iron or Steel) *60%*
Sq. Hd. Cap.....*55%*
Hex. Hd. Cap.....*50%*

Wood—

List Jan. 1, 1900.
Flat Head, Iron.....*80%*
Round Head, Iron.....*75%*
Flat Head, Brass *77½%*
Round Head, Brass.....*72½%*
Flat Head, Bronze *72½%*
Round Head, Bronze.....*70%*
Drive Screws.....*82½%*
Note.—An extra 10 or 10¢5% is often given.

Scroll Saws—See *Saws, Scroll.*

Scythes—

Scythe Snaths—See *Snaths, Scythe.*

Seeders—

Raisin—

Enterprise.....35@30%

Sets—

Awl and Tool—

Brad Awl and Tool Sets:
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools.... *doz. $2.50@2.60*
Aiken's Sets, Awl and Tools: No. 20, ₱ doz. $10.00.60&10@60&10&5%
Fray's Adj. Tool H dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... .....50%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....40&10@40&10&5%

Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe.... ₱ doz.....$9.00

Nail—

Round, assorted.....*gro. $3.25@3.75*
Octagon.....*gro. $4.25@4.75*
Knurled, Good.....*gro. $5.00@5.50*
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Snell's Corrugated, Cup Pt.....50%
Snell's Knurled, Cup Pt..... ....60%

Rivet—

Regular list.....*70@70¢10¢5%*

Saw—

Aiken's Genuine.....₱ doz. $4.50@5.00
Aiken's Imitation .....₱ doz. $3.00@3.10
Atkin's Criterion.....40%
Atkin's Adjustable.....40%
Bemis & Call Co.'s Cross Cut.....50&5%
Bemis & Call Co.'s Plate..... .....20%
Bemis & Call Spring Hammer.....50&5%
Disston's Star and Mona ch.....25%
Hammer, Bemis & Call Co.'s new Pat.40%
Morrill's No. 1, $15.00.....40&20%
Nos. 3 and 4, Cross Cut, $25.00..40&20%
No. 5, Mill, $31.00.....40&20%
No. 10, $15.50.....40&20%
No. 11, $16.00.....40&20%
Taintor Positive, ₱ doz. $18.....60%

Sharpeners, Knife—

Tanite Mills ₱ gross, $14.40....35@33⅓%

Shaves, Spoke—

Iron.....*doz. $1 00@1 25*
Wood.....*doz. $1.75@2.25*
Bailey's (Stanley R. & L. Co.).....50&10%
Goodell's, ₱ doz. $9.00.....15&10%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13 00*	*15.00*	*17 00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap..*60¢10¢10@70¢5%*
" *Nickel*.....*60@60¢5%*
Fair qual. Jap.....*75¢10@80%*
" *Nickel*.....*70¢10@75%*
Tailors' Shears.....*40@40¢10%*
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....40@40&5%
National Cutlery Co., Nickel....60&10%
National Cutlery Co., En. Hdls...70&1 %
Seymour's, Jap.....70@70&5%
Seymour's Nickel.....60@60&5%
Seymour's Tailors' Shears.....40%
Wilkinson's Hedge.....50%
Wilkinson's Sheep.....15%

Tinners' Snips—

Forged Handles, Steel Blades..20¢10%
Malleable Handles, Laid with Steel. 40%
Forged Handles, Steel Blades, Berlin.. Niagara Snips.....40&10%
Seymour's..... .....40@40&5

Pruning Shears and Tools—

Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00 .....25@25&10%
John T. Henry Mfg. Company
Pruning Shears all grades.....50&5%
Orange Shears.....50&30%
Grape.....50&10%
Tree Pruners.....75%
P., S. & W. Co.....33⅓@33⅓&10%
Seymour's.....60&10&10@70&5%

Sheaves—Sliding Door—

Stowell's Anti-Friction..... 50%
Patent Roller..... .60&10@60&10&5%
Patent Roller Hatfield's, Sargent's list, 80&10@80&10&7%
Reading..... ..... 70&10@75%
R. & E..... .....45&10%
Wrightsville, Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....70&10@75%
R. & E..... .....60@60&10%
Sargent's list.....50&5@50&10&5%

Shells—

Shells, Empty—

Brass Shells, Empty:
First quality, all gauges.....60&5%
Club, Rival, Climax, 10 and 12 gauge.. 65&5%
Paper Shells, Empty:
Club, Rival, Climax, Ideal, 14, 16 and 20 gauge ($7.50 list).....20&10&5%
Club, Rival, Climax, League, 10 and 12 gauge.....33⅓&5%
Acme, Leader, New Rapid, Ideal, Smokeless, 10, 12, 16 and 20 gauge. 33⅓&10&5%
Trap and Metal Lined, 10, 12, 16 and 20 gauge.....33⅓&10&5%
Primrose Club, Blue Rival, Yellow Rival, New Climax, 10, 12, 16 and 20 gauge.....90%
High Base, Nitro, Repeater, Defiance, New Victor, 10, 12, 16 and 20 gauge 15%

Shells, Loaded—

Loaded with Black Powder..... *40¢5%*
Loaded with Nitro Powder..... *40¢10¢10¢5%*

Shoes, Horse, Mule, &c.—

Factory Shipments:
Horse and Mule, per keg.....*$3.75*
Burden's, all sizes.....$3.70
Bryden, Phœnix, Perkins, &c $3.75
Diamond State, Shoenberger, Crescent, &c. $3.75.....5%
NOTE.—*See Trade Report.*

Shot—

Drop, up to B, 25-lb. bag...*$1.30@1.35*
Drop, up to B, 5-lb. bag ..... *.30*
Drop, B and larger, 25-lb. bag.... *$1.55@1.60*
Drop, B and larger, 5-lb bag..... *.35*
Buck, 25 lb. bag..... .....*$1.55@1.60*
Buck, 5-lb. bag..... *.35*
Chilled, 25-lb. bag.....*$1.55@1.60*
Dust Shot, 25-lb. bag..... *2.00*
Dust Shot, 5-lb bag..... ... *.50*

Shovels and Spades—

No. 2, Polished, Sq. or Rd. Point, D or L Handle:

	A1, 1st Grade.	*B2, 2d Grade.*
Plain Back....	*$10.50*	*$9 60*
Strap Back....	*9.90*	*9.00*
Cleveland Pat'n	*10.20*	*9.30*
	C3, 3d Grade.	*D4, 4th Grade.*
Plain Back....	*$8.70*	*$8.10*
Strap Back.....	*8.10*	*7.50*
Cleveland Pat'n	*8.40*	*7.80*

All other sizes add 30c doz.
Black deduct 30c doz.
Note.—The above are the regular Association prices to small retailers, but are often shaded by jobbers.

Shovels and Tongs—

Brass Head .....60&5@60&10%
Iron Head .....60&5@60&10%

Sieves and Sifters—

Hunter's Imitation. gro. $11.00@18.00

Buffalo Metallic Blued. S. S. & Co., ₱ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

Eclipse.....₱ gr. $10.00
Electric Light.....₱ gr. $12.00
Hunter's Genuine.....₱ gr. $12.50
Shaker (Barler's Pat.) Flour Sifters. ₱ doz., $3.00.....35%

Sieves, Wooden Rim—

Mesh 18, Nested, doz.....$0.75@0 80
Mesh 20, Nested, doz..... .85@ .90
Mesh 24, Nested, doz ..... 1.00@1.05

Sinks—

Cast Iron—

Low list.....60@65%

NOTE.—*The low list is now generally used, but some jobbers use high list*

Wrought Steel—

Columbus Galv'd and Enameled..60&5%
Columbus, Painted 45%
L. & G. 50%

Skeins, Wagon—

Cast Iron.....70@70&10%
Malleable Iron.....40&10@50%
Steel.....35@35&5%
I. I. & B. Co. Steel.....35%

Slates—

"D" Slates.....50&10@50&10&10%
Unexcelled Noiseless Slates..... 60&6 tens@60&6 tens&5%
Wire Bound.....40&10@50%
Double Slates, add $1 case, net.

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German.....40@40&10%

Covert Mfg. Co.:
Derby.....35&2%
High Grade.....45&2%
Jockey.....40&2%
Trojan.....45&2%

Covert's Saddlery Works:
Banner.....60&10%
Crown.....60&10%
Triumph.....60&10%

W. & E. T. Fitch Co.:
Bristol.....40&10%
Empire.....50&5%
German.....40%
National.....50&5%
Perfect.....45%
Clipper.....50&5%
Champion.....40%
Security.....40%
Victor.....60&5%

Oneida Community:
Solid Steel.....65@65&10%
Solid Swivel.....55@55&10&10%
Sargent's Patent Guarded..... 60%@60%&10%

Snaths—

Scythe.....45&5%

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Silver Plated—

Flat Ware .....50&10@60&10%
Wm. Rogers M'g. Co.....50&10%

Miscellaneous—

German Silver .....60&10%

Wm. Rogers Mfg. Co.:
18% German Silver.....60%
Rogers' Silver Metal.....50&10%

Springs—

Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in....₱ doz. $1.10@1.25
Warner's No. 1, ₱ doz. $1.50; No. 2, $3.40.....55@55&10%
Victor (Coil).....60&10@60&10&5%

Carriage, Wagon, &c.

1¼ in. and wider...Blk. Hf Brt. Brt.
Tested and Temp 5¼ 5¼ 6c lb
Oil Tested and Tempered..... 6¼ 6¾ 7c lb
Cliff's Bolster Springs.....35%
Cliff's Seat Springs.....₱ pair 55¢

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.... } *List May 1, '95..*
Steel and Iron... } *70@70&5@.....%*
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels. 40&10@40&10&10%
Disston's Try Sq. and T-Bevels....60&10%
Winterbottom's Try and Miter...50&10%

Squeezers—

Lemon—

Wood, Common, gro., No. 0, $5.00; No. 1, $5.75@$6.00; No. 2, $10.00.
Wood, Porcelain Lined:
Cheap .....doz. $2.00@2.75
Good Grade.....doz. $3.00@3.50
Tinned Iron .....doz. $0.75@1.25
Iron, Porcelain Lined doz. $2 90@3.25
Jennings' Star.....₱ doz. $1.85@1.90
King.....₱ doz. $2.00

Staples—

Barbed Blind.....lb. 9@10c
*Electricians', Association list..*75&10%
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting ..... 80&10%
Grand Crossing Tack Co.'s list....75&10%

Steels, Butchers'—

Dick's.....40%
Foster Bros'.....30%
C. & A. Hoffmann's.....40%
Nichols Bros.....50%

Steelyards.....25@25&10%

Stocks and Dies—

Blacksmiths'.....40%
Gardner.....50%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%
Curtis Reversible Ratchet Die Stock.25%

Stone—

Scythe Stones—

Pike Mfg. Co., list '95-'96.....33⅓%
Cleveland Stone Co., list Nov., '92..33⅓%

Oil Stones, &c.

Pike Mfg. Co.:
Hindostan No. 1, ₱ lb...8¢
Sand Stone.....5¢
Turkey Oil Stone, Extra, 5 to 9 in.....80¢ } 33⅓&10%
Turkey Slips.....$1.50
Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....50¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 5 to 7 in. $3.90
Arkansas Stone, No. 1, 5½ to 8 in. $3.50
} 33⅓@33⅓&10%
Tanite Mills:
Emery Oil, ₱ doz. $5.00.....50@60%

Stoners—

Cherry—

Enterprise.....25@30%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00; No. 2, $11.00, 40&20%

Stops, Window—

Ives' Patent.....25&5%
Taplin's.....45%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Straps, Box—

Cary's Universal case lots.....20&10%

Stretchers, Carpet—

Cast Iron, Steel Points ...doz. 55@65c
Cast Steel, Polished.....doz. $2.25
Socket.....doz. $1.75

Stuffers, Sausage—

Miles' Challenge, ₱ doz. $30...50@50&5%
Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks:
American Blued .....90@90&10%
American Tinned.....90@90&10%
American Cut Tacks. ..... 85&10@85&10&10%
Swedes Iron Tacks.....90@90&10%
Swedes Upholsterers' Tacks. ..... 90&20@90&25%
Gimp Tacks.....90&20@90&25%
Lace Tacks.....90&30@90&25%
Trimmers' Tacks.....80@90&10%
Looking Glass Tacks.....70@70&10%
Bill Posters' and Railroad Tack.... 90&20@90&25%
Hungarian Nails .....80&5@80&15%
Common and Patent Brads.....70&5%
Trunk and Clout Nails ..... 75&5@75&10&5%

NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&5% on Standard Weights.****

Miscellaneous—

Double Point Tacks.....90&5@90&10%
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50&10@60%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. $3.20
Emerald, S. S. & Co.....60-gal., $4 00
Queen City S. S. & Co., 0-gal.....$3.50
Queen City S. S. & Co., 60-gal.....$4.25

Tapes, Measuring—

American Asses' Skin.....40&10@50%
Patent Leather.....25@30&5%
Steel.....40@40&5%
Chesterman's.....25@25&5%
Eddy's Steel.....40@40&5%
Eddy's Metallic.....33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30&5%

Thermometers—

Tin Case.....30@30&10%

Ties, Bale—Steel.

Standard Wire.....60&10&5%

Ties, Wall—

Cleveland, Steel.....₱ 1000, $10.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco*

Tools—

Coopers'—

L. & I. J. White .....20@20&5%

Saw—

Atkins' new list.....40%
Simonds' Improved. 33⅓%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Game—

Oneida Pattern..... ..70&10@75&5%
Newmouse.....45@50%
Hawley & Norton. .....65&5@70%
Victor (Oneida Pattern).....75@75&10%
Star (Blake Pattern.....65&10@70&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes. 9@10c
Mouse, Round or Square Wire.....
doz. $0.85@1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz. $12.00; case of 24 $10.50
No. 3, Rat, ₱ doz. $5.50; case of 50 $5.00
No. 3½, Rat, ₱ doz. $4.50; case of 72 $4.00
No. 4, Mouse, ₱ doz. $3.50; case of 72 $2.75
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00; No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00.....50%
Out o' Sight, Mouse, No. 1, ₱ doz., 60¢; Rat, No. 2, $1.25; Mole, $6.00; Gopher, $1.50; Stop Thief, No. 1, $1.25; No. 2, $1.50.

Fly—

Balloon, Globe or Acme..... *doz. $1.25; gro. $14.50@15.00*
Harper, Champion or Paragon ..... *doz. $1.50; gro. $17.00*

Trimmers, Spoke—

Bonney's Nos. 1 and 2.....40%
Stearns'..... 25%

Trowels—

Disston Brick and Pointing..... .....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....40%
Never-Break steel Garden Trowels.... gro. $7.00
Peace's Plastering 30%
Rose Brick and Plastering.....25&5%
Woodrough & McFarlin, Plastering.25&10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Daisy Stove Trucks, Improved pattern ₱ doz. $18.00

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$5.00*	*5 50*	*6.00*

Galvanized S. S. & Co., with Wringer Attachment, ₱ doz., No. 10, $7.25 No. 20, $7.75; No. 30.....$8.25

Twine—

Miscellaneous—

Flax Twine—	*BC*	*B.*
No. 9, ¼ and ½-lb. Balls	*22c*	*26c*
No. 12, ¼ and ½-lb Balls	*19c*	*22c*
No. 18, ¼ and ½-lb. Balls	*16c*	*19c*
No. 24, ¼ and ½-lb. Balls	*16c*	*19c*
No. 36, ¼ and ½-lb. Balls	*15c*	*18c*

Chalk Line, Cotton, ½-lb. Balls..... *15@20c*
Cotton Mops, 6, 9, 12 and 15 lb. to doz .....7@8c
Cotton Wrapping, 5 Balls to lb ..... 9@16c
American 2-Ply Hemp, ¼ and ½-lb. Balls ..... *12@13c*
American 3 Ply Hemp, 1-lb. Balls.. *15@15c*
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....10c
India 3-Ply Hemp, 1-lb Balls.....10c
India 3-Ply Hemp, 1½-lb. Balls....9c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls... 8@9c
Mason Line, Linen, ½-lb. Balls.. 45c
No. 26, Mattress, ¼ and ½-lb. Balls 25c
Wool.....7c

Vises—

Solid Box.....50@.....$
Bonney's Saw Vises.....40&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40&10%
Fisher & Norris Double Screw....15&10%
Hollands'.....40@40&10%
Lewis Tool Co.....20@30%
Massey's Perfect.....15@20%
Massey's Clincher .....30@40%
Morrill's.....20%
Miller's Falls.....low list 10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....66⅔@66⅔&10%
Simpson's Adjustable.....40%
Snedliker's X. L.....20@25%
Stephens'.....20@25%
Toles' Woodworking.....25%
Trenton.....40&5@40&10%

Saw Filers—

Bonney's, No. 1, $13; No. 3, $16.50&10%
Disston's D 8 Clamp and Guide, ₱ doz $30.....25%
Reading.....40&10%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....30&7½%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60%

Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870..... .40%

Wads—Price Per M.

	Dis. 50&5%
B. E., 11 up	*60c*
B. E., 9 and 10.....	*70c*
B. E., 8	*80c*
B E., 7.....	*80c*
P. E., 11 up.....	*$1.00*
P. E., 9 and 10.....	*1.25*
P. E., 8	*1.50*
P. E., 7.....	*1.50*
Ely's B. E., 11 and larger..	*$1.70@1.75*
Ely's P. E., 12 to 20	*$3.00@3.25*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—
S. S. & Co. Reduced List..... .....40%

Cast Iron, Hollow—

Stove Hollow Ware:
Ground.....60@60&7½%
Unground.....65@65&10%
White Enameled Ware:
Muslin Kettles ...75&10@75&10&5%
Boilers and Saucepans...55@55&5%
Tinned Boilers and Saucepans..... 55@55&5%

See also *Pots, Glue.*

Enameled—

Agate Nick 1 Steel Ware, list July '99.40%
Granite Ware, list Jan. 1, '94, revised Jan. 2, '95 .....40&10%
Second Quality, Agate Nickel Steel..65%
Second Quality, Granite ..... 70&10@70&10&10%
Iron Clad:
Peppered Ware, high list.....70%
Princess Ware, special list.....33⅓%
Mottled Ware, high list.....75%
Never Break Enameled....50&5@50&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each.....	*40c*	*45c*	*50c*	*60c*

Steel Hollow Ware.

Avery Spiders & Griddles ....65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles..... 65@65&5%
Never Break Kettles.....60@60&10%
Solid Steel Spiders & Griddles. 70@70&5%
Solid Steel Kettles.....60%
Solid Steel Ware, Enameled ..... 50&5%

Silver Plated Hollow—

William Rogers Mfg. Co.....40&10%

Washboards—

Solid Zinc:	₱ doz
Crescent, family size, bent frame.	$3.00
Red Star, laundry size, stationary protector.....	$4.25
Double Zinc Surface:	
Saginaw Globe, family size, stationary protector.....	$2.65
Wilson, family size, bent frame...	$2.75
Single Zinc Surface:	
Naiad protector, family size, open back perforated.....	$2.40
Saginaw Globe, protector, family size, ventilated back.....	$2.25
Wilson, bent frame, family size, ventilated back	$2.25

Washers—
Leather, Axle—
Solid.....80&10&10@85%
Patent.....85@85&5%
Coil: ⅜ 1 1½ 1¾ *Inch.*
15c 13c 11c 16c *per 100*
Iron or Steel—
Size bolt ... *5-16* ⅜ ½ ⅝ ¾
Washers....$6.20 5.50 4.00 3.80 3.60
In lots less than one keg add ¼c per lb., 5-lb. boxes add ½c to list.
NOTE—*Jobbers' prices generally lower than manufacturers'.*

Washer Cutters—
See *Cutters, Washer.*

Washing Machines—
See *Machines, Washing.*

Water Coolers—
See *Coolers, Water.*

Weaners—
Tyler's New Hatter—No. 1 ₩ doz. $3.45; No. 2, $3.70; No 3, $4.00; No 4 $4.30
Tyler's Steer—Nos. 1 and 2, ₩ doz. $1.70; No. 3, $2.00; No. 4, $2.30.

Wedges—
Oil Finish.....*lb.* 4@4¼c
Axe Finish.....*lb.* 4¼@4½c

Weights, Sash—
Carloads at factory.....$21.00@.....
Less than carloads at factory.....
$22.00@.....
NOTE.—*There is a wide difference in prices East and West, and some Foundries are naming considerably higher prices than the above.*

Well Buckets, Galvanized
See *Pails, Galvanized.*

Wheels Well—
8-in., $1.75@2.00; 10-in., $2.25@2.60; 12-in., $2.75@3.25; 14-in., $3.00@4.50

Wire and Wire Goods—
Market: Nos. 6 to 16:
Br. & Ann.....70&5@72½%
Cop'd.....65&5@67½%
Galv.....65&5@67½%
Tin'd, Tin'd list.....72½&5@75%
Stone, Br. and Ann'd:
Nos. 19 to 26.....77½@77½@2½%
Nos. 27 to 36.....77½&5@77½@7½%
Annealed Wire on Spools.....
60&10@60&10@5%
Brass, list Feb. 26, '96.....15%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$5.00 to $, 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
Iron and Brass, list July 1, 1899....
80&10@80&10&10%

Wire Cloth and Netting—
Galvanized Wire Netting.....
75&10&5@30%
Painted Screen Cloth per 100 ft...
$1.40@....

Wire Barb—See *Trade Report.*

Wire, Rope—See *Rope, Wire.*

Wrenches—
Agricultural.....75@....%
Baxter's S.....60&10%
Coes' Genuine.....33⅓&10&5&5&3%
Coes' "Mechanics'.33⅓&10&10&5&5&3%
Acme.....60&10%
Aiken's Pocket (Bright).....$2.00@3.20
Alligator.....60&10&10%
Bemis & Call's:
Adjustable S.....35&5%
Adjustable 3 Pipe.....40%
Brigg's Pattern.....30&10%
Combination Black.....40&10%
Combination Bright.....40&5%
Cylinder or Gas Pipe.....55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Sindley Automatic.....30%
Boardman's.....33⅓%
Bull Dog, W. & B.....60&10&10%
Donohue's Engineer.....40&10%
Eagle.....50&10%
Hercules.....70%
Solid Handles, P. S & W.....50%
Stevenson.....60&10&10%
Stillson's.....55%

Wrought Goods—
Staples, Hooks, &c., list March 17 '93.....80&20@85%

Yokes, Neck—
Covert Saddlery Works Trimme 1.60&5%
Covert Saddlery Works, Neck Yoke Centers.....70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters'.. list net

Zinc—
Sheet.....*lb* 7¾c@8c

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.
Lead, Foreign white, in Oil.. .. 7½@ 9⅜
Lead, American White, in Oil:
Lots of 500 ℔ or over.....@ 6¼
Lots less than 500 ℔.....@ 6¾
Lead, White, in oil, 25 ℔ tin pails, add to keg price.....@ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....@ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price..@ 1¼
Lead White, Dry in bbls.....@ 5¼
Lead, American. Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry.....₩ ℔ 4½@ 5¼
Zinc, Paris, Red Seal.....@ 8⅝
Zinc, Paris, Green Seal.....@ 9⅞
Zinc, Antwerp Red Seal.....@ 7⅜
Zinc, Antwerp, Green Seal.....@ 8⅝
Zinc, V. M. in Poppy Oil, G. Seal lots of 1 ton and over.....@11⅜
lots less than 1 ton.....@12⅛
Zinc, V.M. in Poppy Oil, Red Seal, lots of 1 ton and over.....@10⅛
lots of less than 1 ton.....@11¼
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls. 4%. No discount allowed on less than 10 bbl. lots.

Dry Colors.
Black, Carbon.....₩ ℔ 6 @20
Black, Drop, Amer.....2½@ 4
Black, Drop, Eng.....5 @10
Black, Ivory.....9 @20
Lamp, Coon.....3 @ 5
Blue, Celestial.....₩ ℔ 5½@ 8
Blue, Chinese.....35 @40
Blue, Prussian.....3 @38
Blue, Ultramarine.....7 @35
Brown, Spanish.....½@ 1
Brown, Vandyke, Amer.....1¾@ 2½
Brown, Vandyke, Foreign.....2½@ 5½
Carmine, No. 40.....₩ ℔$2.15@2.75
Green, Chrome, ordinary.....5 @ 6
Green, Chrome, pure.....19 @25
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over.....@ 6¼
Lots less than 500 ℔.....@ 6¾
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over.....@ 6¼
Lots less than 500 ℔.....@ 6¼
Ocher, French Washed.....1½@ 2½
Ocher, Dutch Washed.....4½@ 5
Ocher, American...₩ ton $10.00@15.00
Orange Mineral, English..₩ ℔ 9 @12
Orange Mineral, French.....11½@11¾
Orange Mineral, German.....9½@12
Orange Mineral, American....8¼@..
Red, Indian, English.....4½@ 8½
Red, Indian, American.....3 @ 3¼
Red, Turkey, English.....7½@10
Red, Tuscan, English.....7 @10
Red, Venetian, Amer., ₩ 100 ℔. 80@1.10
Red Venetian, English ₩ ℔.... 1½@ 2
Sienna, Italian, Burnt and Powdered.....₩ ℔ 3½@ 6
Sienna, Ital., Raw, Powd.....3½@ 6
Sienna, American, Raw.....1½@ 2
Sienna, American, Burnt and Powdered.....₩ ℔ 1½@ 2
Talc, French.....₩ 100 ℔ $1.25@1.50
Talc, American.....90 @1.10
Terra Alba, French, ₩ 100 ℔..80 @1.00
Terra Alba, English.....85 @1.00
Terra Alba, American No. 1....65 @70
Terra Alba, American No. 2....45 @50
Umber, Turkey, Bnt. & Pow. ₩ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer.....1½@ 2
Umber, Raw, Amer.....1½@ 2
Yellow, Chrome.....10½@25
Vermilion, American Lead.....10 @25
Vermilion, Quicksilver, bulk..@69
Vermilion, Quicksilver, bags..@70
Vermilion, English, Import..71 @72
Vermilion Chinese.....80 @90

Colors in Oil.
Black' Lampblack.....10 @14
Blue, Chinese.....35 @40
Blue, Prussian.....32 @36
Blue, Ultramarine.....12 @16
Brown, Vandyke.....10 @13
Green, Chrome.....8 @14
Green, Paris.....@34
Sienna, Raw.....10 @13
Sienna, Burnt.....10 @13
Umber, Raw.....9 @12
Umber, Burnt.....9 @12

Miscellaneous.
Barytes, Foreign, ₩ ton....$18.00@20.00
Barytes, Amer. floated.....19.00@20.00
Barytes, Crude.....8.00@10.00
Chalk, in bulk.....₩ ton 2.15@ 2.25
Chalk, in bbls.....₩ 100 ℔ 35@ ..
China Clay, English..₩ ton 11.00@17.00
Cobalt, Oxide.....₩ 100 ℔ 2.00@ 2.10
Whiting, Common. ₩ 100 ℔ .42½@ .55
Whiting, Gilders.....47@ .56
Whiting, extra Gilders'.....57@ .64

Putty.
In bulk.....@$1.75
In bladders.....@2.25
In cans, 12½, 25 and 50 ℔....@2.35
In cans, 1 to 5 ℔.....@4.00

Spirits Turpentine.
In Southern bbls.....@51
In machine bbls.....@51½

Glue.
Low Grade.....₩ ℔ 13 @15
Cabinet.....13 @16
Medium White.....14 @16
Extra White.....19 @25
French.....12 @25
Irish.....13 @15

Animal, Fish and Vegetable Oils.
Linseed, City, raw.....₩ gal. 50 @51
Linseed, City, boiled.....52 @53
Linseed, S. Ale and West'n, raw 47 @48
Linseed, raw Calcutta seed.....@65
Lard, Prime.....45 @48
Lard, Extra No. 1.....38 @39
Lard, No. 1.....36 @37
Cotton-seed, Crude.....29 @ ..
Cotton-seed, Summer Yellow, prime.....33½@33
Cotton-seed Summer Yellow, off grades.....31½@ ..
Sperm, Crude.....@ ..
Sperm, Natural Spring.....@ ..
Sperm, Bleached Spring.....@ ..
Sperm, Natural Winter.....54 @55
Sperm, Bleached Winter.....59 @60
Whale, Crude.....@ ..
Whale, Natural Winter.....44 @45
Whale, Bleached Winter.....45 @46
Whale, Extra Bleached Win...48 @49
Menhaden, Crude, Sound.....@27
Menhaden, Light Pressed.....29 @30
Menhaden, Bleached Winter...32 @33
Menhaden, Extra Bleached.....@35
Tallow, prime.....50 @52
Cocoanut, Ceylon.....6 @ 6¼
Cocoanut, Cochin.....6½@ 7
Cod, Domestic.....34 @36
Cod, Newfoundland.....34 @40
Red Elaine.....36 @40
Red Saponified.....₩ ℔ 5 @ 5½
Bank.....₩ gal. .. @ ..
Straits.....@ ..
Olive, Italian, bbls.....56 @60
Neatsfoot, prime.....46 @48
Palm, prime, Lagos.....₩ ℔ 5½@ 5¾

Mineral Oils.
Black, 20 gravity, 25@30 cold test.....₩ gal. 11 @11½
Black, 29 gravity, 15 cold test. 12 @12½
Black, summer.....10½@11
Cylinder, light filtered.....15 @17½
Cylinder, dark filtered.....13 @18
Paraffine, 903-907 gravity.....14 @14½
Paraffine, 903 gravity.....13 @13½
Paraffine, 883 gravity.....11½@12
Paraffine, red, No. 1.....14 @14½
In small lots ½¢ advance.

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CURRENT METAL PRICES.

JANUARY 3, 1900.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ ℔; Square, 0.8¢ ₩ ℔

1 to 1¾ in. round and square	₩ ℔ 2.50@2.60¢
1¾ to 4 in. x ⅜ to 1 in.	
Refined Iron:	
1 to 1¾ in. round and square	₩ ℔ 2.60@2.70¢
1½ to 4 in. x ⅜ to 1 in.	
1½ to 4 in. x ¼ to 5-16	₩ ℔ 2.80@2.90¢
Rods—⅝ and 11-16 round and square	₩ ℔ 2.80@2.90¢
Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger	3.25¢
3 to 3½ in. x 3-16 in.	3.25¢
1¼ to 3 in. x ⅛ in.	3.40¢
1½ to 2½ in. x 3-16 in. and thicker	3.30¢
1 to 1¼ in. x 3 16 in.	3.40¢
1 to 1¼ x ¼ in.	3.50¢
⅛ x ⅛ in.	3.60¢
¼ x ⅛ in.	3.65¢
⅛ x ⅛ in.	4.50¢
½ x 3-32 in.	5.00¢
Tees:	
1 in.	3.70¢
1¼ to 2½ in.	3.60¢
3 in. and larger	3.40¢
Beams	4.00¢
Channels	4.00¢
Bands—1¼ to 6 x 3-16 to No. 8	₩ ℔ 3.10¢
"Burden's Best" Iron, base price	₩ ℔ 3.60¢
Burden's "H. B. & S. Iron, base price	₩ ℔ 3.40¢
"Ulster"	₩ ℔ 3.40¢
Norway Bars	4 @4½¢
Norway Shapes	4½@5 ¢

Merchant Steel from Store—

	per ℔
Open Hearth and Bessemer Machinery	3.00 to 3.10¢
Toe Calk, Tire and Sleigh Shoe	3.75@4.00¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	6 ¢

Soft Steel Sheets—

¼ inch	3.30¢	No. 14	3.40¢
3-16 inch	3.40¢	No. 16	3.50¢
No. 8	3.30¢	No. 18	3.55¢
No. 10	3.30¢	No. 20	3.60¢
No. 12	3.35¢	No. 22	3.65¢

Sheet Iron from Store.

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔, 3.30	3.30¢
Nos. 17 to 21	₩ ℔, 3.35	3.40¢
Nos. 22 to 24	₩ ℔, 3.40	3.50¢
Nos. 25 and 26	₩ ℔, 3.45	3.55¢
No. 27	₩ ℔, 3.50	3.60¢
No. 28	₩ ℔, 3.55	3.70¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ ℔ 10½¢
Patent Planished	₩ ℔ A, 9¾¢; B, 8¾¢, net.
Patent Planished Sheet Steel	₩ ℔ 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16	₩ ℔, 12¢	70&5&70&10% off
Nos. 17 to 21	₩ ℔, 13¢	
Nos. 22 to 24	₩ ℔, 14¢	
Nos. 25 to 26	₩ ℔, 15¢	
No. 27	₩ ℔, 16¢	
No. 28	₩ ℔, 17¢	
No. 29	₩ ℔, 19¢	
No. 30	₩ ℔, 21¢	

36 in. 1¢ ₩ ℔ higher.

Foreign Steel from Store—

Best Cast	₩ ℔ 14 ¢
Extra Cast	₩ ℔ 16½ @ 17 ¢
Swaged, Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 14 ¢
Blister, 1st quality	₩ ℔ 12 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 14 ¢
2d quality	₩ ℔ 13 ¢
3d quality	₩ ℔ 11 ¢
R. Mushet's "Special"	₩ ℔ 46 ¢
" " " Annealed	₩ ℔ 75 ¢
" " "Titanic"	₩ ℔ 19 ¢
Hobson's Choice XX Extra Best	₩ ℔ 85 ¢
Jessop Self Hardening	₩ ℔ 40 ¢
Seamans' "Nelson" Steel	40 ¢
Hobson Self-Hardening	₩ ℔ 40 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free. Per ℔

Banca, Pigs	27¢
Straits, Pigs	26@26½¢
Straits in Bars	27¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20	$7.50
IX, 14 x 20	9.00
Melyn Grade:	
IC, 14 x 20	7.00
IX, 14 x 20	8.50
Allaway Grade:	
IC, 14 x 20	6.15
IX, 14 x 20	7.25

American Coke Plates—Bessemer—

IC, 14 x 20 .....108 ℔	$5.30@5.40
IX, 14 x 20	6.25@6.30
IXX, 14 x 20	7.50@7.60

American Terne Plates—

IC, 20 x 28	$10.50
IX, 20 x 28	12.50

Tin Boiler Plates, American—

IXX, 14 x 26 .....112 sheets	$13.00
IXX, 14 x 28 .....112 sheets	14.00
IXX, 14 x 31 .....112 sheets	16.50

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	17¼¢
Ansonia grade Casting	16¾¢

Sheet and Bolt—

February 2, 1899. Prices, in cents per pound. Net.

Sheet 30 x 60.

Net wider than	Not longer than	And longer than	64 oz. & over, 9-lb. sheet, 30 x 60 and heavier.	32 oz. to 64oz. 25 to 30 lb.	24 oz. to 30 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7½ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7½ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	22½	22½	22½	22½	23½	24½	25½	28½	31½
30	96	72	22½	22½	22½	22½	23½	25½	28½	31½	
30	.....	96	22½	22½	22½	22½	24½	28½			
36	72	.....	22½	22½	22½	22½	24½	26½	29½	32½	
36	96	72	22½	22½	22½	22½	24½	28½	31½		
36	120	96	22½	22½	22½	22½	25½				
36	.....	120	22½	22½	22½	24½					
48	72	.....	22½	22½	22½	24½	26½	29½	32½		
48	96	72	22½	22½	22½	25½	27½	30½			
48	120	96	22½	22½	24½	25½	30½				
48	.....	120	22½	23½	25½	26½					
60	72	.....	22½	23½	25½	26½	28½	33½			
60	96	72	22½	23½	24½	26½	31½				
60	120	96	22½	23½	25½	28½					
60	.....	120	22½	24½	26½	30½					
72	96	.....	22½	23½	25½	30½					
72	144	96	22½	24½	27½	33½					
72	.....	144	23½	25½	30½						
108	120	.....	23½	25½	31½						
108	.....	120	25½	26½							
wider than 108	144	.....	26½	28½							
	.....	144	27½	30½							

Bolt Copper, ½ inch diameter and over, ₩ ℔ 22½¢

Circles, Segments and Pattern Sheets, 2¢ ₩ ℔ advance over price of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper. 14 oz. ₩ square foot and heavier. 1¢ ₩ ℔ over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.

All Polished Copper, 20 in. wide and under. 1¢ ₩ ℔ advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₩ ℔ advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ ℔ more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ ℔	26½¢
12 oz. and up to 14 oz. to square foot, ₩ ℔	27½¢
10 oz. and up to 12 oz., ₩ ℔	29½¢
Lighter than 10 oz., ₩ ℔	30½¢

Circles less than 8 in. diameter, 2¢ ₩ ℔ additional.

Circles over 18 in. diameter are not classed as Copper Bottoms.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

Nos.	0000 to 8 Base	9 and 10		11 and 12
		½¢		½¢ ₩ ℔ adv.
Nos.	13	14	15	16
		¾¢	1¢	1½¢ ₩ ℔ adv.
Nos.	17	18	19	20
	1½¢	2¢	2½¢	2½¢ ₩ ℔ adv.

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Feb. 6, 1899. Net. Outside Diameter.

Stubs' W. G.	B. & S. W. G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	...	.....	.....	.....	33	31	30	29	28	27	25	24
12	10	...	.....	37	35	33	31	30	29	28	27	25	24
13	11	...	.....	37	35	33	31	30	29	28	27	25	24
14	12	...	41	37	35	33	31	30	29	28	27	25	24
15	13	...	42	38	36	33	32	31	30	30	28	26	25
16	14	...	43	39	37	34	33	32	31	30	29	26	25
17	15	...	44	40	38	35	34	33	32	31	30	27	26
18	16	61	46	42	39	36	35	34	32	31	30	28	27
19	17	62	47	43	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	42	41	40	39	38	37	37	36
23	22	76	61	50	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	46	45	44	43	42	40	40	41
25	24	86	72	56	52	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ ℔ additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
30	30	30	27	21	21	21	21	21	21	21	21	23	23	27	28¢ ₩ ℔

Copper, Bronze or Gilding Tubes, 3¢ ₩ ℔ additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Feb. 26 1896

Brown & Sharpe's gauge standard.

				Per ℔.
Plain Round Tube, ⅛ in. up to 2 in.				$0.35
"	"	⅛	" ¼ "	.36
"	"	¼	" ⅜ "	.38
"	"	⅜	" ½ "	.41
"	"	5-16	" ½ "	.48
"	"	¼	" 5-16 "	.65
"	"	3-16	" ¼ "	1.00
"	"	⅛	" 3-16 "	1.50
Smaller than ⅛ inch				Special
3 inch and larger				.40
Over 3 inch to 3½ inch, inclusive				.45
Over 3½ inch				.50

Bronze and Copper, advance on Brass List, 3 cents.

Discount from list 5 ..... 30@25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass Wider than and including	in. 9 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24	in. 24 26
To No. 20, inclusive	.22	.23	.25	.27	.29	.31	.33	.36
Nos. 21, 22, 23 and 24	.23	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39
Common High Brass Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.

Add 1¢ ₩ ℔ additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 10%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gild'g bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 10%; Copper Wire, NET. List November 16, 96.

Spring Wire. 2¢ ₩ ℔ advance.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ ℔

Western Spelter ..... 5¼@5¾¢

Zinc.

Duty: Sheet, 2¢ ₩ ℔.

600 ℔ casks.....7¾¢ | Per ℔ .....8¼¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ ℔. Pipe and Sheets, 2½¢ ₩ ℔.

American Pig	5@5½¢
Bar	5½¢
Pipe (full lengths), subject to discount 20%	6½¢
Pipe (cut lengths), subject to discount 20%	7½¢
Tin Lined Pipe, subject to discount 20%	12½¢
Block Tin Pipe, subject to discount 20%	40¢
Sheet (full rolls) subject to discount 20%	7½¢
Sheet (cut rolls (subject to discount 20%	8½¢

Old Lead in exchange, 4¢ ₩ ℔.

Solder.

½ & ½, guaranteed	18½¢
No. 1	16@16½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson	₩ ℔ 11¼@11½¢
Hallett's	₩ ℔ 10¼@ 10½¢
U. S.	₩ ℔ 10½¢

Aluminum—

Duty: Crude, 8¢ ₩ ℔. Plates, Sheets, Bars and Rods, 13¢ ₩ ℔.

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting:

Small lots	₩ ℔ 37¢
100-℔ lots	₩ ℔ 35¢

No. 2 Aluminum (guaranteed to be over 90 % pure), in ingots for remelting:

Small lots	₩ ℔ 34¢
100-℔ lots	₩ ℔ 33¢

Aluminum Sheet, B. & S. gauge. 50 ℔ or more.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ ℔.	₩ ℔.	₩ ℔
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 ℔ 5¢ ₩ ℔ extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ ℔ 40¢	No. 15	₩ ℔ 43¢
No. 9 to No. 10	₩ ℔ 40½¢	No. 17	₩ ℔ 50¢
No. 11	₩ ℔ 41 ¢	No. 18	₩ ℔ 55¢
No. 12	₩ ℔ 41½¢	No. 19	₩ ℔ 60¢
No. 13	₩ ℔ 42 ¢	No. 20	₩ ℔ 65¢
No. 14	₩ ℔ 42½¢	No. 21	₩ ℔ 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ ℔ 14½¢
Light and Tinned Copper	₩ ℔ 13½¢
Heavy Brass	₩ ℔ 10½¢
Light Brass	₩ ℔ 8½¢
Lead	₩ ℔ 4½¢
Tea Lead	₩ ℔ 4¢
Zinc	₩ ℔ 3½¢
No. 1 Pewter	₩ ℔ 17 ¢
No. 2 Pewter	₩ ℔ 9 ¢
Tin Plate Scrap	₩ ton $6.00
Wrought Scrap Iron	₩ gross ton $13.00
Heavy Cast Scrap	₩ gross ton $11.50
Stove Plate Scrap	₩ gross ton $7.50
Burnt Iron	₩ gross ton $5.50

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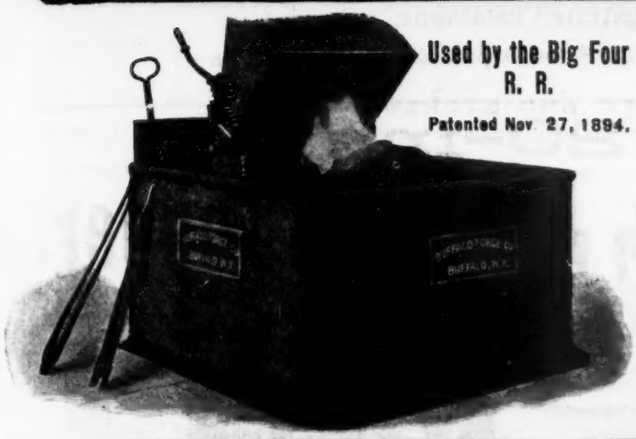

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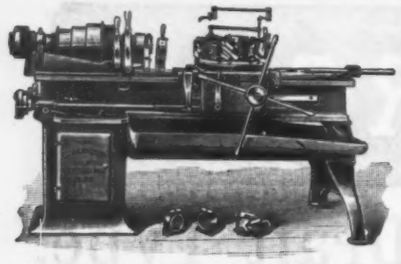

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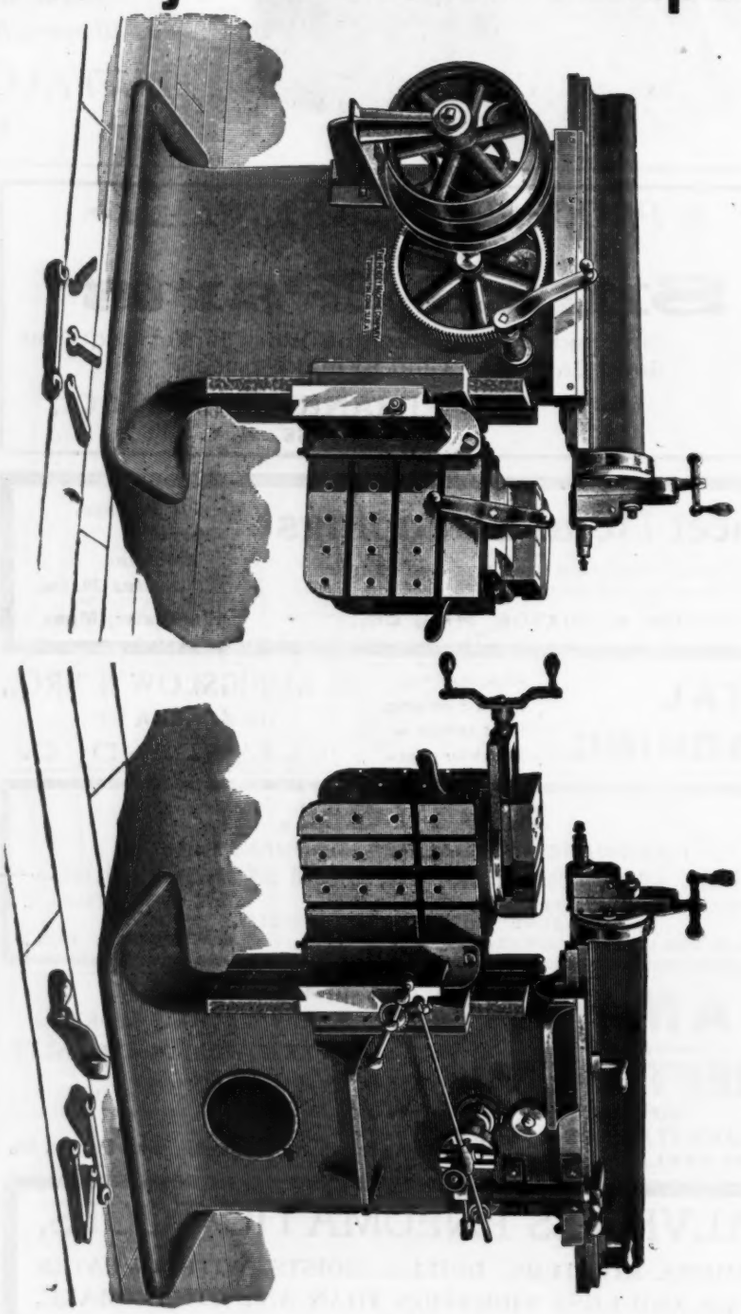

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